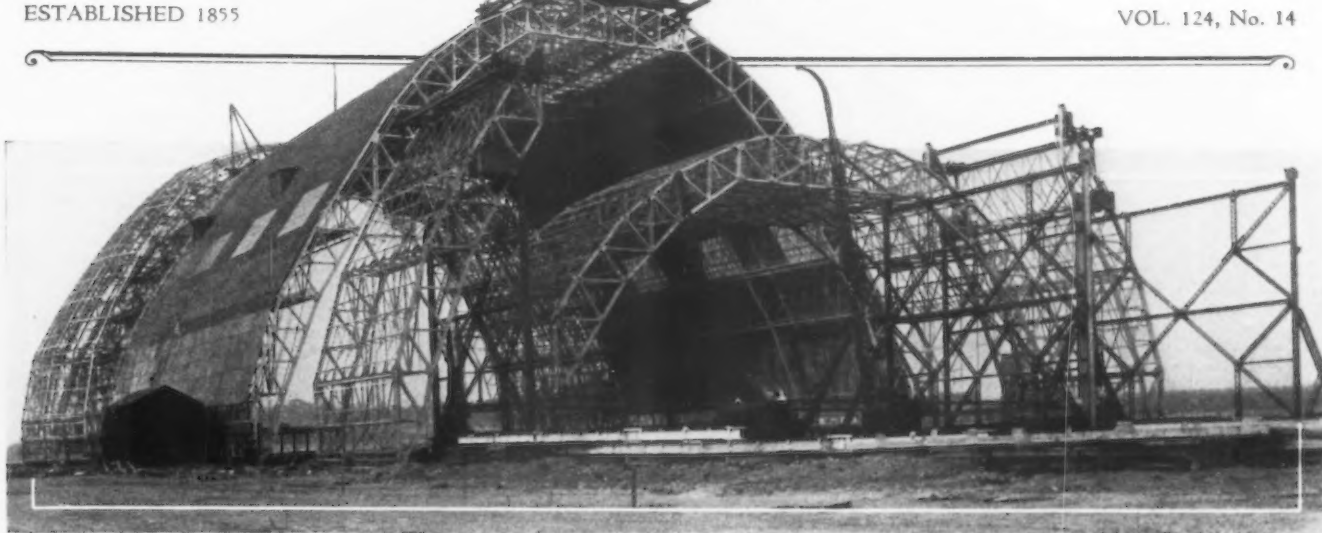


THE IRON AGE

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Huge Airship Factory and Dock Is Nearing Completion

PROPER conception of the magnitude of the Goodyear-Zeppelin Corporation's airship factory and dock now nearing completion at Akron, Ohio, is difficult to convey by pictures or even to acquire by a visit to the site, because the structure is set in a flat valley which has been graded exactly level for an area about a mile in diameter. Consequently there is no nearby structure of ordinary size which gives the scale of the construction.

The views show the skeleton about two-thirds completed; over-all dimensions are 1175 ft. long, 325 ft. wide, and 197.5 ft. high. The floor area is large enough for ten football gridirons.

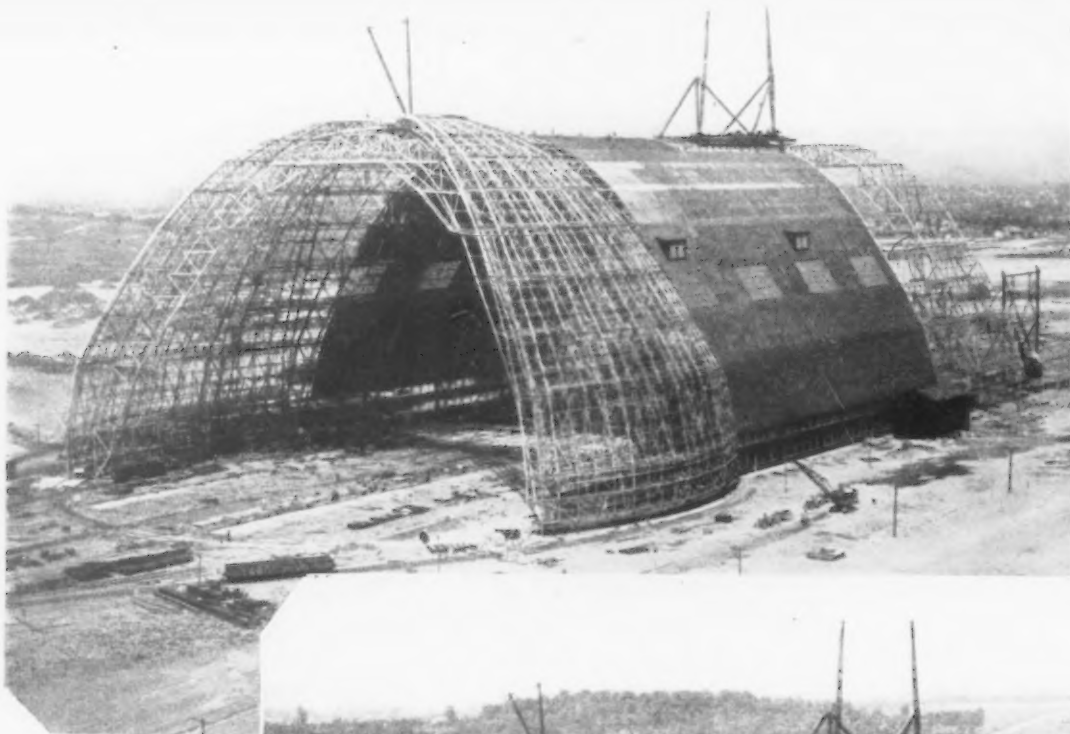
The main structure consists of eleven three-hinged arches (with silicon steel main chords) set 80 ft. on centers. A unique method of erection was devised by the American Bridge Co.—haunches of a pair of arches are erected, the inner ends resting on temporary vertical bents, and all cross bracing attached. The central portion of this double arch is then erected in a low position, hoisted vertically to position with the aid of counterweights, and riveted fast. A traveller on the roof then erects the intermediate members.

About 5350 tons of structural and silicon steel is required for the main shed. Four door leaves at the ends (made by the Detroit Steel Products Co.) require 1800 tons more. Physical properties are as follows:

	Structural Steel, Lb. per Sq. In.	Silicon Steel, Lb. per Sq. In.
Minimum yield point.....	30,000	45,000
Ultimate strength.....	55,000 to 65,000	80,000 to 95,000
Design Stress:		
Dead and snow load.....	18,000	24,000
Maximum from wind load..	24,000	32,000

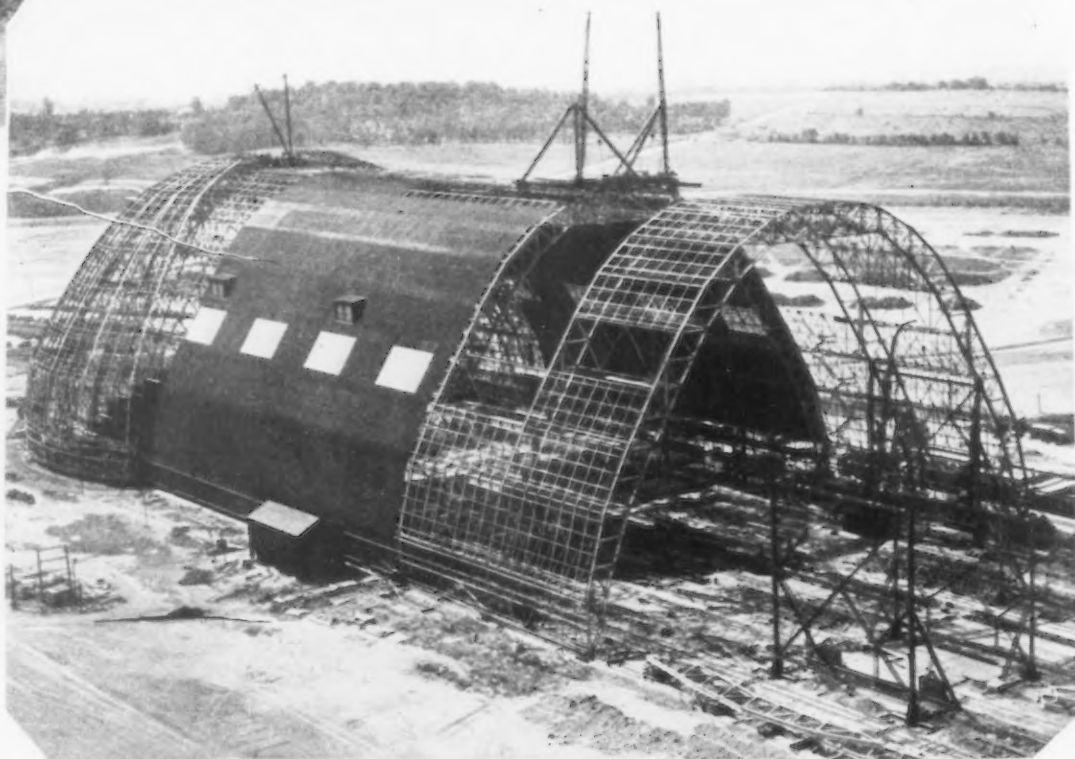
Doors are shaped like segments of huge orange peel; they are hinged at the top to a 17-in. pin, 6 ft. long, set in a spherical joint 30-in. in diameter. At the bottom, each door rests on 40 forged steel wheels, separately journaled and sprung, rolling on a standard gage railroad track curved to a 187.7-ft. radius. Each door is opened and closed by a rack and pinion drive constructed by the Wellman-Seaver-Morgan Co. The rack consists of a 14-in. H-beam, bent to proper radius and built into the door near the base; teeth are 4-in. pins set 9 in. apart. Meshing into them is a bull gear with 22 teeth, connected to a 125-hp. General Electric motor by suitable worm gearing. Time limit relays, switches and controls are so arranged that a single push-button will close the doors in five minutes; deceleration at the end automatically occurs so the leaves creep together without bumping. Roof covering and siding is Robertson protected metal, with large corrugations fastened with special clips to resist stress in all directions.

Huge though this building is, it will house only one of the Navy airships to be constructed by Goodyear-Zeppelin Corporation. ZRS-4 and ZRS-5 are each to be 134 ft. diameter and 785 ft. long. Ample room is available at the sides of the structure for a row of shops and offices 42 ft. wide by 640 ft. long—a considerable manufacturing plant in itself. Longitudinal I-beams are attached to the lower chords of the main arches for 6-ton electric trolleys, to be used for erecting material into the airship structure or hoisting working platforms. Artificial light will be provided, all electrical equipment being carried in special gas-tight conduits and boxes, and all circuit breakers and fuses located outside the building.



STEEL Work for Spherical Doors Is Erected at This End. Doors are shown in the open position, rolled back past the end of the building, which has not yet been covered with corrugated metal

APAIR of Arches Has Been Hoisted to Position, and Part of Intervening Rafters Erected Near Ground. Remainder of rafters and purlins will be erected from traveller on roof. False work to support haunches of next arch erected in right foreground



Underground storage for over 1,000,000 cu. ft. of helium gas at 750 lb. pressure will be provided in the form of about 100 pieces of 24-in. steel pipe, closed at both ends with forged heads, welded on, and with welded connections to an outlet manifold. Since each of the

airships will require about 6,500,000 cu. ft. of gas each, a railroad siding is being installed alongside the gas handling plant, together with necessary piping, long enough for a dozen tank cars, each containing about 600,000 cu. ft. of helium under pressure.

Antiquity of Iron Discussed at Institute Meeting

T. A. RICKARD, the American mining journalist, contributed a discussion of the origin of iron smelting to the fall meeting of the (British) Iron and Steel Institute. He discounts the evidence of the piece of iron found imbedded in the Great Pyramid, built 2900 B. C., believing that the circumstantial account of its discovery is honest but mistaken. He bases his argument against such an early use of iron in industry by relics or inscriptions where iron is used or mentioned with gold as a precious metal.

Old poems or legends mentioning the use of iron, Mr. Rickard says, date from the author's time, which would be several centuries after the events he recounts. After considering all the evidence, Mr. Rickard concludes that the smelting of iron from its ores was commenced by the Hittites in what is now known as Anatolia, Asia Minor, some time after 1400 B. C. Previous to that time the only iron known was meteoric, which was very rare and costly.

Chrome-Nickel Stainless Alloys

Chemical and Physical Properties and Applications in Chemical Field—Chromium the Real Corrosion Resistant in Stainless Steels

BY T. HOLLAND NELSON*

MY two previous articles, [THE IRON AGE, April 25, page 1139, and May 30, page 1478] on the subject of stainless steel and chromium irons have each contained reference to the fact that I intended dealing with the nickel-chromium alloys in this field as a separate topic. I have done this in an attempt to avoid confusion and unfair comparisons.

Existing bibliographies are available for those who are interested in tracing the history of these alloys through the various patents and technical papers of a variety of inventors and authors on the subject. I shall, however, refer to only two of the outstanding metallurgists, who were undoubtedly pioneers in the development of these particular alloys. I refer to Dr. Benno Strauss, of the Krupp Laboratories, Essen, Germany, and to C. M. Johnson, of the Crucible Steel Co. of America. To their work and early patents on the subject much has since been added both by themselves and other workers.

The high alloys of chromium and nickel with iron had been a source of difficulty and worry to the metallurgist until comparatively recently. For a considerable time much trouble was experienced in producing material capable of being hot worked, although they were available in the cast form for heat-resisting purposes. Annealing presented quite a problem and of course machinability depended substantially upon the success of the annealing operation or the production of an alloy which did not require annealing to produce machinability.

Continued metallurgical study of these problems has finally enabled us to solve many of them and today we

are able to establish definite ratios of chromium to nickel in iron with carbon, to produce material capable of being manufactured commercially into practically all the variety of shapes and sections which could be called for by the structural or chemical engineer.

Patent Situation Outlined

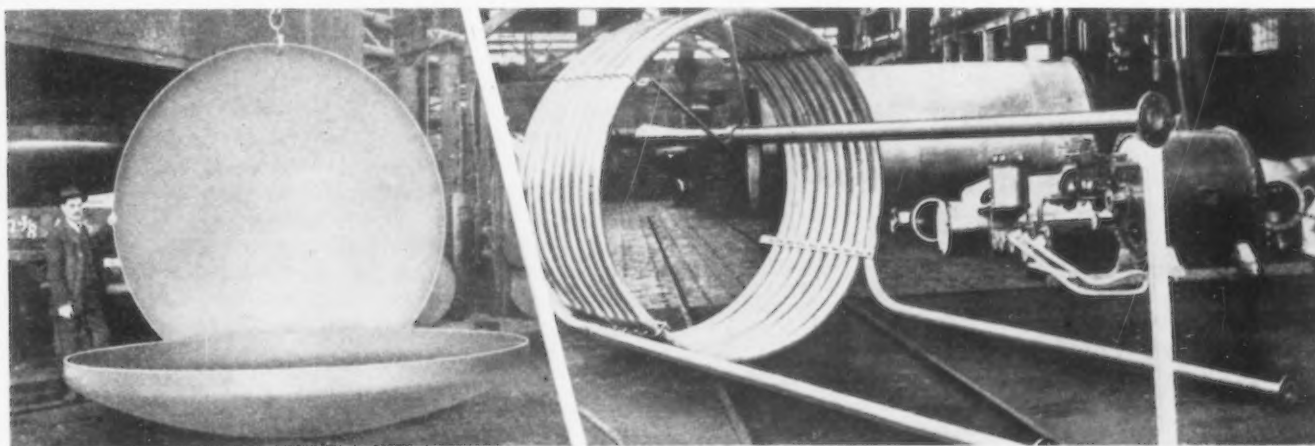
IN this particular alloy field, the patent situation is extremely regrettable. Chromium and nickel ranges have been allowed to overlap so hopelessly that an absolute disregard of any patents on the subject has resulted. The recent merging of various patents in the chrome-nickel series shows not only sound business common sense but holds out also the hope of wider development of the alloys themselves. There is within the scope of these various patents many alloy combinations of value not owned exclusively by any one patentee and therefore the trade has suffered as a result.

Within a short space of time I am convinced that we shall see a series of chrome-nickel alloys with varying proportions of nickel and chromium advocated unanimously by both patentee and licensee alike without the conflict of claims due to patent limitations.

Ratio of Nickel to Chromium

BEFORE the value of a definite ratio of nickel to chromium was established, many of these alloys were of such a type that they were martensitic, austenitic-martensitic, or entirely austenitic and, substantially as they existed through the hot working range, so were they not malleable, partially malleable or quite malleable.

In my first article I referred to a homogeneous structure as being the ideal for resistance to corrosion and,



COIL (Right) Made from Chrome-Iron Alloy (Courtesy of Enduro Committee). Flanged and dished heads (left) for tank or boiler construction. These can readily be made from either chrome-iron or chrome-nickel alloys. (Courtesy of Lukens Steel Co.)

*Consulting metallurgist, Widener Building, Philadelphia. In THE IRON AGE of April 25, Mr. Nelson discussed the basic questions of stainless steel and in the issue of May 30, various alloys of chromium and iron.

so far as the chrome-nickel alloys are concerned, a homogeneous structure means not only ideal corrosion resistance but also reasonable malleability for hot-working operations such as forging, rolling, etc., and general fabrication.

Generally speaking, a material containing say from 16 to 18 per cent chromium requires from 9 to 11 per cent nickel present to render it entirely austenitic. Whereas if the chromium is raised say to 22 to 24 per cent then a nickel content of from 7 to 9 per cent would accomplish the same object. A material too low in nickel or chromium content would be correspondingly "red short," due to the fact that it would be unstable, partially martensitic and as a finished product difficult to machine and almost impossible to anneal.

Four Different Products

With this knowledge it is not difficult to understand that the rapid development which has taken place with the chrome-nickel alloys has been substantially with such alloys as are entirely austenitic—yet not too heavily alloyed to render them unnecessarily expensive.

modified to simpler design before they could be executed in straight chrome-iron.

Let us glance at the physical properties of a typical one of these alloys and review some of the outstanding features that such analysis modification brings about and then perhaps we shall more fully realize why the nickel-chrome alloys are to be regarded as a decidedly advantageous addition to the existing stainless steels and irons.

Chemical and Physical Properties of Chrome-Nickel Alloys

Chemical Analysis:		Per Cent
Carbon	under	0.07 or 0.15 as desired
Silicon	under	0.75
Manganese	under	0.50
Sulphur	under	0.025
Phosphorus	under	0.025
Nickel	from	8.00 to 10.00
Chromium	from	16.50 to 19.50

Physical Properties:

(This is an austenitic material annealed by quenching)

Tensile strength, lb. per sq. in.	85,000 to 95,000
Yield point, lb. per sq. in.	30,000 to 40,000
Elongation in 2 in., per cent.	55 to 60
Reduction of area, per cent.	70 to 75
Brinell hardness	130 to 140
Izod impact (V notch)	100 to 120 ft. lb.



A TYPICAL Pickling Installation Showing Hydrochloric Acid Tank, Nitric Acid Tank and Spare Tank for Washing Off with Water. (Courtesy Lukens Steel Co.)

As evidence of this I have taken four popular brands and quote the manufacturer's analysis in each case. Incidentally it is amusing to note that each of them is operating under a different patent:

	No. 1 Per Cent	No. 2 Per Cent	No. 3 Per Cent	No. 4 Per Cent
Carbon	0.10 to 0.12	0.10 to 0.25	max. 0.20	max. 0.12
Silicon	0.75	1 to 3	max. 0.50	0.40 to 0.60
Chromium ..	17 to 19	17 to 19	17 to 20	18
Nickel	8 to 9	8 to 10	7 to 10	8 to 9

Where Is the Demand for Chrome-Nickel Alloys?

IT might be assumed that because the chromium-irons, previously dealt with in the other articles, have been adapted so readily to the chemical field there might be little demand for a similar material containing nickel, which obviously also increases the price.

However, experience with the stainless steels and chromium-irons in the building of chemical equipment brought to light many difficulties which were not easily surmounted. As for instance, due to the difficulty experienced in welding chromium-iron, large heating coils which called for tubes or pipe in one single length were extremely difficult to obtain. Many difficult bends and joints that could have been readily welded had to be

As stated above, just because many installations have been successfully built from chrome-iron, it does not necessarily follow that the chrome-irons were everything that could be desired. To date I know of not one single installation which has failed due to corrosive attack, but the fabrication was due entirely to close cooperation between the manufacturer of the material, the designing engineer and the fabricator and many modifications in design were necessary on account of the high physical properties of the material (particularly as induced by work hardening) restricted heating ranges, the difficulty of welding, etc., etc. Such modifications at times impaired general efficiency but were necessary, due to the material itself. Therefore any material a little more "fool-proof," more ductile, or with wider hot working ranges, either in the steel works or the fabricating shops, becomes immediately a welcome addition.

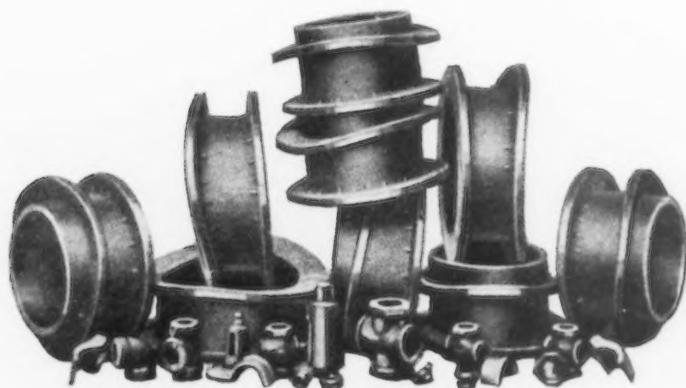
The nickel-chromium alloys offer us many of these improvements which in turn means that the designer can more nearly approach his true design. The wider temperature range makes it possible for both steel manufacturer and fabricator to form more complicated shapes the more readily and the absence of the serious grain growth which develops in the straight chromium-iron

at high temperatures, such as when welding, opens up the possibility of welded structures where welds for other reasons are not considered detrimental.

The Chromium-Iron Brittle Range

THE embrittlement of chromium-iron, due to prolonged heating in a temperature range between 850 and 1050 deg. Fahr., which caused considerable trouble in the oil industry, for a while, was responsible for the manufacturers of seamless tubes welcoming the advent of the chromium-nickel alloys, which so far apparently have shown no tendency to develop this phenomenon. Various reasons have been offered as an explanation to account for this brittleness, all of which, to the author's mind, are still inconclusive. Nor am I satisfied that a similar condition will not develop in some of the chrome-nickel alloys under certain atmospheric conditions although it may be in a less dangerous range and over a much longer time cycle.

Some of these alloys are yet so close to an unstable compound that elevated temperatures are apt to show striking results. These remarks are not made as a pessimist but because the author, in handling these stainless

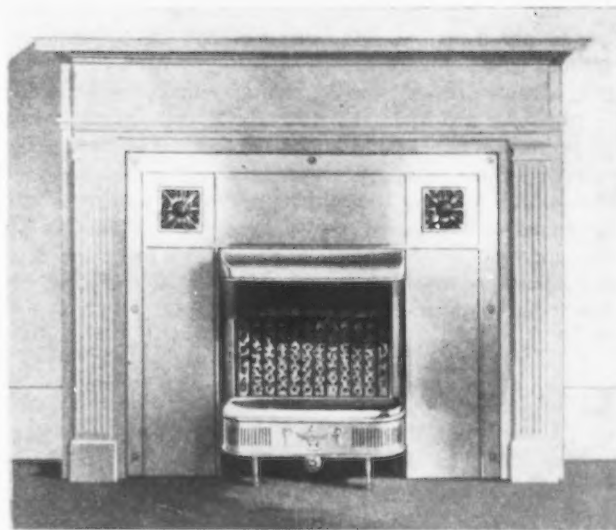


Castings, Typical of the Kind Produced from Chrome and Nickel-Chrome Alloys

alloys since their birth, has seen childish and unwarranted optimism lead to disappointing and serious results. Coming from the original school of stainless steel, and following through the development of chromium-iron and having been associated in some capacity with practically all the large installations in the country has naturally brought to my attention many limitations of the straight chromium-alloys. I would unhesitatingly state, however, that, while welcoming the development of the chrome-nickel alloys, they cannot be regarded as a cure-all and every care should be used in their selection.

A very popular combination before us at the moment is that known as the "18 and 8 type," signifying 18 per cent chromium with 8 per cent nickel. The typical analysis and physical properties of this material are to be found in the preceding table. The low elastic limit, together with such high ductility as exhibited in the elongation, reduction of area, impact and Brinell, clearly explain how readily this metal can be cold worked. Articles of extremely intricate design can be formed and fashioned from this alloy which it would be impossible to produce in a straight chrome material.

Like all other metals these alloys become harder with continued cold work, which of course is reflected in an increase in the tensile strength and elastic limit, with a corresponding reduction in the elongation and reduction of area. A simple heat treatment, i.e., rapidly heating to 1900-2000 deg. Fahr. and either air cooling or



Fireplace Made from Chrome-Nickel Alloy

quenching according to section, will restore the original ductility of the annealed material.

A Personal View Regarding Nickel Content

THE author can perhaps make his own view still more clear (and incidentally leave himself open to serious criticism) by stating frankly that, in practically all these alloys, it is the chromium which gives the metal its corrosion-resistant properties. Undeniably the nickel additions are valuable more particularly in regard to their bearing upon the physical properties, which are of course reflected in easy fabrication.

If my view regarding the chromium is incorrect, then show me one of the commercial chrome-nickel alloys which does not contain more than the minimum chromium content stipulated by Brearley* as being required to produce a stainless or corrosion-resistant alloy. Further I would refer to the work of Pilling and Ackerman in an excellent paper on the subject of iron-nickel-chromium alloys wherein they state:

The solubility in nitric acid of sufficient dilution to afford rapid rates of corrosion may be affected by changes in content of nickel, chromium or iron, yet the point at which substantial passivity is reached depends practically wholly on the chromium content independent of nickel or iron.

Inasmuch as I have made very definite claims regarding the value of chromium and its effect on the re-

*Mining and Metallurgy, Feb., 1929.



Dinner Ware Made from Chrome-Nickel Alloy

sistance to corrosion, it should be clearly understood that I am aware of high-nickel-silicon alloys with and without small quantities of chromium; also the nickel-molybdenum alloys, which show remarkable resistance to sulphuric and hydrochloric acid. These are beyond the scope of this article and enter a different field from that covered by the alloys of chromium and nickel-chromium so far dealt with by the author, for which no claims have been made with regard to resistance to hydrochloric and sulphuric acids. I believe much will be heard of these new alloys in the near future and they too will be welcomed by the chemical engineer.

General Working Instructions

FORGING.—The chrome-nickel alloys available today of the "18 and 8" or similar type can be forged or rolled from a temperature of approximately 2200 deg. Fahr. down to about 1700 deg. Fahr. without difficulty. Working below this temperature is difficult and has a tendency to rupture if not crack and burst the material. Slow heating to approximately 1500 deg. Fahr. and then more rapid heating to maximum temperature is advised.

ANNEALING.—Being an austenitic alloy, the softest condition is obtained by heating the material to a temperature of from 1900-2100 deg. Fahr., according to modifications in analysis, and cooling as rapidly as possible. Air cooling on thin section is sufficient, but more massive sections would require quenching.

PICKLING.—It should be unnecessary to explain that the scale produced by any hot-working operation must be removed before any of these alloys can be considered in the best condition to resist rust or corrosion. The reason for this is explained in my first article.

The method of pickling the chrome-nickel alloys is substantially the same as that adopted with the straight chrome-irons and steels, except that sand blasting is not recommended to accelerate pickling, due to the fact that the material is so soft that the particles of sand readily become embedded in it. The general practice is to place the heat-treated material in a solution of hydrochloric acid, 20 to 40 per cent acid, to which sometimes a smaller percentage of nitric acid is added, allow it to remain until the scale is removed, wash with water and immerse in a solution of nitric acid, 10 to 20 per cent in water, with a final wash off in clear water. The temperature of the hydrochloric acid bath can be raised with advantage to approximately 180 to 200 deg. Fahr. and the material has a tendency to show a somewhat whiter surface if the subsequent immersions in nitric acid and final washing in water are also done hot. A typical pickling installation is shown in one illustration.

CASTINGS.—One sometimes despairs of the possibility of obtaining perfect castings in this type of alloy. The shrinkage of this material is approximately 9/32 in. compared to 1/8 in. in the case of cast iron. The rapidity with which the metal solidifies and the difficulty of convincing the ultimate user that he cannot get castings usually of the same low carbon content as the wrought material are but a few of the difficulties with which the alloy foundry is confronted.

There is no denying the fact that the nickel-chromium alloys are much more popular in the foundry than the straight chromium and today we are able to obtain, in either chromium or chrome-nickel, all types of fittings, manhole frames, nozzles, etc., such as are illustrated. Producing bars, sheets, plates, etc., is one thing. To produce a finished article in the cast form is another.

Alloy Foundry's Problems Today

THE problems before the present-day alloy foundry are largely due to the fact that, when an engineer picks a material to build his equipment from, he will ex-

pect to obtain that same material throughout his job, even to the cast parts. The result is that alloy foundries receive orders from time to time calling for castings from such and such a brand of material, which is advertised to a chemical specification practically impossible to produce in the cast form.

A foundry has its own problems to deal with and the wise buyer will have his castings made by a reliable house from a material of substantially the same analysis as that the rest of the equipment is to be built from, but leaving the foundry to make such modifications as may be necessary to produce sound clean castings capable of being machined.

Because there are 15 or 20 different trade names for materials with but slight variance in chemical analysis, there is no reason why there should be the same number of casting analyses, which has led in many cases to castings which on one hand were sound and not machinable, and on the other, material which was machinable but not sound. In the chrome-nickel alloy range, the foundryman needs his latitude, or working margin of safety, if you care to call it such. So that if you send a plate or bar specification to a foundry for castings do not be surprised if the intelligent foundryman declines to quote.

It is not easy to produce a perfectly satisfactory surface on a casting. Pickling is resorted to just as on the wrought material but the surface inundations and imperfections on such a rough surface have a tendency to hold small particles of foreign matter. In the early stages these small imperfections or inclusions will rust and stain quite a considerable area, but, as they are soluble, in service under corrosive conditions they are gradually eliminated. It is almost impossible to obtain a finished pickled casting which will not show some rust spots on it.

Some Concluding Thoughts

IN concluding this article may I again say that the development in the chrome-nickel alloys is extremely welcome to manufacturer, fabricator and user alike, inasmuch as they have opened up a wider field of application for corrosion-resistant alloys, due to their easier fabricating qualities.

May I, however, again reiterate that due regard should be paid to the chromium content of any alloy which is to be used to combat corrosion (hydrochloric and sulphuric acids excepted) for I am firmly convinced that chromium is the weapon with which we fight corrosion, and nickel, the friend that comes to our rescue when certain alloys have not the physical properties which we may possibly desire.

Finally, I have been asked repeatedly—is "18 and 8" the last word in this type of alloy? I am frank to say that I believe it is nearer the first word and that the future will see us using straight chrome and a series of chrome-nickel and nickel with silicon or chromium or other alloys, each dealing with separate problems.

Principle Established by Brearley

I firmly believe that Brearley established a principle which will carry on for all time. That principle was this, that "a certain percentage of chromium in iron renders that iron-chromium combination insoluble under certain conditions." So shall we find other alloy combinations and shall probably again modify and adjust them to meet the demands of the fabricator, for this is true progress.

My next article will be on heat resistant alloys, which I regard as a question of corrosion by atmospheres or by-products at elevated temperatures, in which chrome-nickel and nickel-chrome alloys in entirely different ratios play an important part.

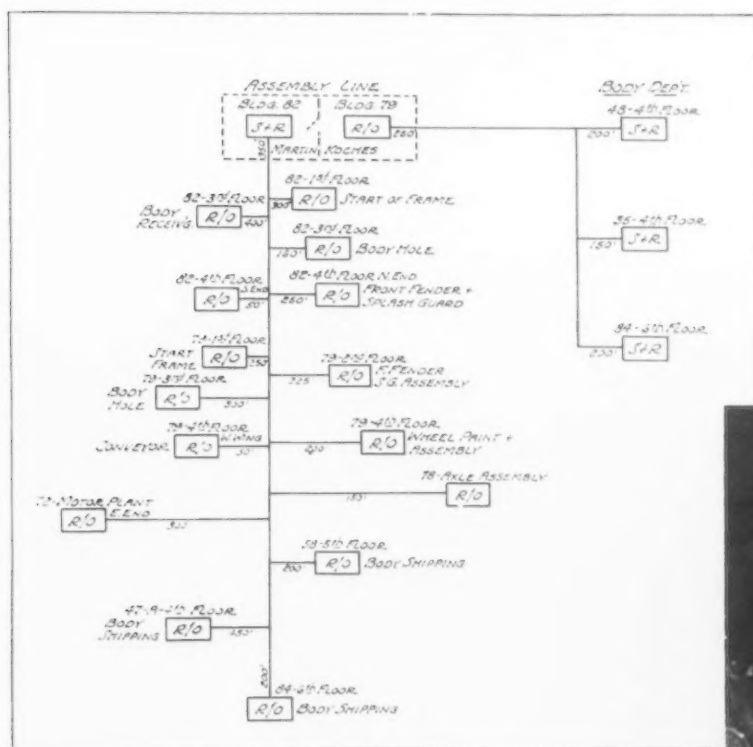
Keeps Production Costs Down

By Closely Regulating Movement of Stock Through Manufacturing Departments, Studebaker Corporation Lowers Expenses

ONE of the statements most frequently heard nowadays is that "in buying an automobile one gets one's money's worth." This opinion has developed as a result of a general downward revision of prices within the automobile industry, and in most cases reductions have been made possible by the inauguration of manufacturing economies. To keep costs at a minimum

Each part has its own "bank," or reserve stock, to feed the main assembly lines. The size of the bank is determined by a number of shop schedule clerks who study plant operations and set the proper "bank" for every part.

As a protection against sudden development of a shortage of material, a six-days' supply of each part is



COMMUNICATION Between Various Production Departments and the Final Assembly Lines Is Maintained by Means of a Telephone Typewriter System Shown in the Diagram (Left). R/O indicates a "receiving only" instrument, S O a sending instrument and S+R a sending and receiving machine. The photograph below shows a department head receiving a message from the final assembly department



figure in a plant capable of turning out 600 cars a day is the task which faced the management of the Studebaker Corporation at South Bend, Ind. How this is done is described in the following paragraphs.

Appropriations for manufacturing purposes originate in the finance committee, which is composed of officers and members of the board of directors. After an appropriation has been made, the sales department makes up a car schedule for the next three months, staying, of course, within the limits of the appropriation. The car schedule, when transmitted from the sales department to the manufacturing division, constitutes the latter's authority to purchase materials and to make sufficient parts to supply the assembly lines for 90 days.

While some parts going into Studebaker automobiles are bought from outside sources, most of the major parts are manufactured by the company. In this connection the fact is obvious that there must be a well-defined method of scheduling production of parts to conform to the needs of the assembly lines. This is done by adhering to the following plan.

THE Typewriter Being Used Is the Master Machine in the Production Superintendent's Office, Which Is Sending Messages to the 15 Telephone Typewriters Along the Assembly Line. In the center is the emergency machine and at the right the machine which receives messages from the body department. The cards on the hooks are foreign orders



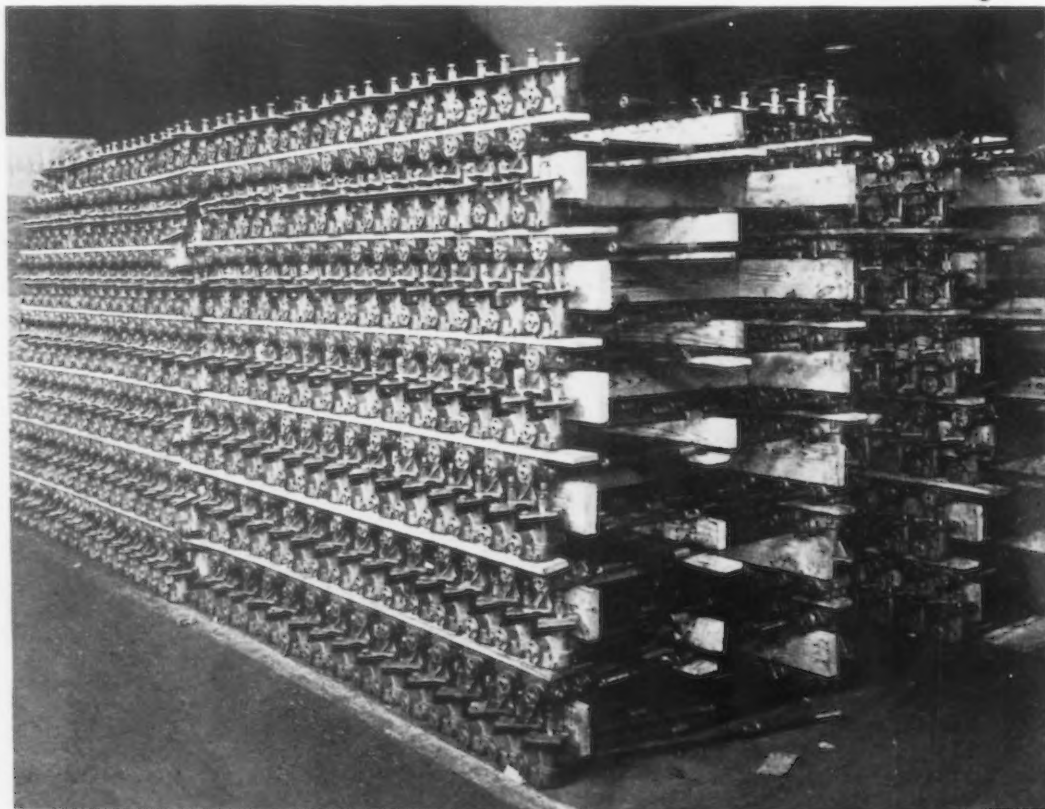
kept in stock, where it is not used except in an emergency. The storekeeper maintains a daily tab on stocks, and if he finds it necessary to go into the reserve supply for material for current production needs, he immediately sends an individual shortage report to the purchasing department, notifying it that the amount of stock has dropped below the danger line. When fresh material is received at the stockroom, the storekeeper brings the reserve supply for that part up again to the proper level and puts the remainder in stock for current use.

This plan has practically eliminated possibility of suddenly exhausting the supply of any part and thereby holding up work along assembly lines. It also serves as a perpetual inventory of reserve stock. It is applied not

only to parts bought from outside sources, but also to those made by the company. In either case an individual shortage notice is equivalent to a rush order for a part required by the production division.

The purchasing department is responsible for getting prices from and placing orders with vendors and for delivery of materials at the specified time. In this respect it is just as important to prevent a surplus of stock from accumulating as it is to assure a proper supply. When material is delivered by vendors, it is checked and weighed in by the receiving department and a report is made to the production records department. Each department manufacturing parts maintains an accurate check of its output by having all finished parts pass

AS a Protection Against Sudden Shortage of Material, a Six-Days' Supply of Each Part Is Kept in Stock, Where It Is Not Used Except in an Emergency



through a clearing house station at final inspection before they leave the department. Here they are counted by a clerk and the production records department is supplied with the information. In this manner the production records department has in its possession at all times data upon which to base shop operations.

Every Department Has Stockroom

Each department has a stockroom in charge of a storekeeper, who has before him a copy of the daily schedule for assembly lines. Material is released from the stockroom according to this schedule. If the foreman of a department along the assembly lines finds that he must have additional stock, the storekeeper gives him the extra amount, but charges it against him as loss of stock. The precaution exercised in releasing stock has prevented

track of his standing. Consequently the production records department draws on the parts production schedule sheet a red line on the date up to which the quota for each part for that month has been manufactured. If the red line for any part has fallen behind the current date, the foreman knows that he is short of his quota and must concentrate on bringing his production of that part up to date. This simplified system helps the foreman to visualize in a moment the position of his department in relation to production needs.

It has already been stated that clearing house clerks count the number of parts going out from operating departments. This information is recorded on transfer tickets, which are sent at the end of each day to the production records department. Night clerks are employed to transfer the accumulated data to the shop schedule



AN Accurate Check of Finished Parts Is Made by a Clerk at a Clearing House Station at Final Inspection Before They Leave the Department in Which They Have Been Manufactured

waste on the part of production departments and has acted as a guard against shortage.

Once a year an inventory of raw and finished stock is taken. Storekeepers count the stock in storage, and clearing house clerks in departments producing parts tabulate the stock on the floor. Throughout the year the production records department compares its stock records with actual stock conditions as reported by storekeepers. If too great a discrepancy exists, a special inventory of the part in question is ordered.

If the use of a part is discontinued or, if a part is superseded by a new part, the production records department ascertains from its files the number of parts on hand. An attempt is made to make the change at a point when the supply of the old part is exhausted, but this is not always possible. If the change is such a decided improvement that the management thinks it advisable to substitute the new part as soon as possible, the cost of the old part and the quantity on hand are considered, and a decision is made in regard to scrapping the old part immediately.

When a new model of automobile is to be put on the market, invariably material for the old model is left over. A list of this stock is made up and given to the service department, which takes the quantity it wants. The remainder is sent to the salvage department, where it is kept until the new model is actually in production. It then is sold as scrap.

Foreman Furnished Production Sheet Monthly

Every month foremen are furnished with a parts production schedule sheet showing the number of parts needed that month and the daily requirements. Since there are usually a multitude of parts going through a department, it is sometimes difficult for a foreman to keep

record, a copy of which is put in the hands of every foreman when he reports for duty at seven o'clock the following morning. Thus he has before him at the beginning of the day the results of the previous day's activities and of the month to date, and is in a position to determine what work is immediately ahead of him.

All of the executives of the company receive daily from the production records department a "current car production and shipment report," which lists the various Studebaker models and sets forth in parallel columns the schedule, production and shipments for the previous day and for the month to date. In a separate column is recorded the number of automobiles over or under the production schedule to date. At the extreme right of the sheet is the number of finished automobiles on hand for shipment to dealers.

Telephone Typewriter System Installed

Communication between various production departments and final assembly lines is maintained by means of a telephone typewriter system, which is the largest installation of its kind in the United States. It consists of 22 machines installed at a cost of approximately \$18,000 and has been in operation since March 1. There are two groups of machines, one group comprising three machines in the body department, which send and also make a copy of what is being transmitted, connected with one receiving machine in the office of the production superintendent. In case one of the machines is in operation, a red light shows on the other two, indicating that the circuit is in use. A white light is the "go ahead" signal. This part of the system keeps the final assembly lines informed of bodies under construction and ready for delivery.

The other group consists of a sending and receiving machine (this machine also makes a copy of what is being

sent) in the office of the foreman in charge of final assembly, connected with 15 receiving machines located at different points along the assembly lines. One emergency typewriter is connected and ready to operate in case anything should go wrong with the machine in the foreman's office. Another is ready to replace any of the 15 typewriters which might develop serious trouble. All of the machines along the assembly lines receive messages from the sending instrument simultaneously.

Back of the system is the idea of coordination, which does away with unnecessary delays in final assembly of Studebaker automobiles. With this method of communication between departments, everyone is kept informed of the different types of cars to be assembled, supervisors thus being enabled to have on hand in their departments all parts essential to keep assembly lines moving on normal schedules.

In place of mimeographed copies of orders formerly

delivered by messengers, instructions now are typed on sending machines. Messages are received in typewritten form on page-size paper, and four copies can be made.

Installation of a conference telephone system of 13 stations was completed recently. Although it is not a direct part of the telephone typewriter service, it supplements it. The system provides for hooking up the entire group of stations so that in reality a conference is held over the telephone without the necessity of department heads leaving their offices. In case anything should go wrong with the typewriters (and, with two emergency machines and experts within call, such a situation is not probable), the telephone conference system could be brought into use as an emergency measure.

The telephone typewriter system has proved of great benefit and is a vital factor in a program of increased production brought about by the concentration of all Studebaker production at South Bend.

Casting Practice to Insure Uniformity in High Carbon Steel



Outline of Ingot. Designed.
To Mitigate Segregation in
High Carbon Steel

AN extended study of the ingot structure for 1.10 per cent carbon steels was reported by Axel Hultgren of Soderfors, Sweden, to the fall meeting of the (British) Iron and Steel Institute. Ingots weighing 1000 lb. and less, cast big end up and with hot top, were sectioned and etched. When teeming moderately hot steel the sectioned ingot showed the usual structure—a skin of fine crystals, a zone of columnar crystals and a center of large dendrites.

Certain blocks of steel were sawed into thin sections and the continuity of crystals traced from one to another, and indicated that these primary crystals are much larger than indicated in a single section; crystals interlock and interpenetrate; the main stems may also become bent and change the direction of the markings. Dark areas among large crystals shown on etched surfaces are crystalline planes approximately parallel to the etching plane.

In general, the direction of crystalline growth is perpendicular to the isothermal surfaces in the cooling ingot, so the columnar crystals generally curve upward. Low carbon or alloy steels which solidify mainly as delta iron develop a secondary crystalline structure when they transform to austenite; this secondary system is related only distantly to the primary dendrites.

The coarse dendritic crystallization may be suppressed by "after pouring" at the correct time and temperature, by stirring the partly solidified ingot, or by teeming very cool. Such fine grained ingots of 1.10 per cent steel all had a low carbon axis (about 0.97 per cent carbon) and a high carbon top. In one experiment the ingot mold was set on a turntable, and during solidification the mold

was oscillated back and forth through a short arc, each reversal being sudden. This produced an ingot with an outer columnar shell about 1½ in. thick with normal carbon, and a very sharp transition to small random crystals; at this plane the carbon analyzed 1.36 per cent.

Analysis of Exuded Drops

Analysis of exuded drops showed the degree of "segregation on a small scale" to be as follows:

	Analysis of Heat	Analysis of Exuded Drop
Carbon	1.10	1.87
Silicon	0.26	0.33
Manganese	0.30	0.46
Phosphorus	0.015	0.029
Sulphur	0.006	0.019

This is a measure of the differences in analysis of the cores of the dendrites and the mother liquor trapped between their branches (much of this segregation is later diffused). Arrow-headed and V segregation "on a large scale" is thought by Mr. Hultgren to represent channels through which such enriched mother liquor has been sucked to feed shrinkage.

From theoretical considerations, the ingot contour illustrated was developed which practically eliminated these "segregations on a large scale," very prominent in slightly tapered ingots. The tendency for segregation is mainly a function of the difference in temperature between beginning and end of solidification, and consequently each grade of steel should be cast in a mold of correct taper for that grade.

Discussion by Dr. Hatfield

In discussion Dr. W. H. Hatfield said there was nothing in the paper which was contrary to the findings of the Institute's Ingot Committee. It would appear that the author had not given sufficient weight to that evidence. Dr. Hatfield challenged the statement which was sometimes made, although not by Mr. Hultgren, that the ingot committee had largely confined its publications to the statement of what was to be observed in current practice, and had not contributed substantially to a complete solution of the troubles of the manufacturer. The author seemed to deal only with small ingots.

Prof. J. H. Andrew suggested that if the author wished to study segregation as known in Great Britain he must obtain his ingots from a country other than his own, for he seemed to have very little segregation in his ingots of high carbon steel.

Making Machine Tools Safe

Adequate Protection Should Be Given at the Cutting Point, the Most Dangerous and the Most Difficult of All to Guard

BY LUTHER D. BURLINGAME*

THE seven seals of safety mark the vital steps by which the safeguarding of machine tools has progressed, seal after seal barring the way to safety having already been broken.

Looking back to the days when machine tools were built without guards and without any provisions for safety, we see the first seal broken when partial and limited guards were applied as a protection against gears, belts and other moving parts. The second seal was broken when makers supplied the complete guards with the machines as placed on the market. The third, when through a redesigning of the machines, gears and danger points were placed inside the machine out of reach, where no guarding was necessary. The fourth, when mechanical controls for shifting belts, operating chucks, changing feeds, etc., became the standard practice; the fifth when individual motor drives largely replaced the use of exposed belts and eliminated other features of danger. The sixth, giving attention to the location and lighting of machines and proper instruction in their use, including also matters of clothing, goggles, etc. The breaking of this sixth seal for safety is still in progress, as is the breaking of the seventh, giving protection at the cutting point, the most dangerous as well as the most difficult of all to guard.

In connection with provision for the control of feeds, speeds and direction by conveniently located levers and push buttons on the outside of the machine, within easy reach and away from danger points, is the feature of convenient and safe dual controls from different stations, so that the workman does not have to step around or reach over the machine. Modern equipment often also includes automatic oiling and automatic control of the coolant. It is important that levers and other hand-operated parts shall have sufficient clearance so that the hand will not be pinched or the knuckles "barked" when at the extremes of movement. It is a feature of protection from accidents as well as safety to the work and tools to have the levers always operate in the direction of the traverse or feed. Where hand-wheels, cranks or other hand-controlled elements are used, and where they may at times be operated at comparatively high speed, the mechanism should be interlocked in such manner that

it will be disengaged so as not to revolve when the power feed is engaged.

When cone pulleys are used and belt shifting is thus required, it has not as yet become usual, except on heavy types of machines, to make belt shifting devices a part of the regular equipment, these still being considered as extras as are also power-controlled chucks, except on turret machines. The trend of the times, however, is toward the adoption of such features, not only because of utility as labor-saving devices, but also for safety.

More attention is being given to providing chain hoists and other accessories as a part of the regular equipment of the machine, so that heavy work and attachments can be moved with less physical exertion and with greater safety. Where chain hoists are used, the question of safety in testing the links of the chain becomes an item for attention.

Where power hoists are used, a "kink" is to have the hand-pulls arrow-headed, with the one that lifts pointing up and the one that lowers pointing down.

A convenience in placing heavy work between centers is to use "cradles" in which the work can rest so that when the footstock center is advanced the work is raised from the rest sufficiently to clear. After the operation is performed, the withdrawal of the center allows the work again to rest in the "cradle" ready for removal. This method is especially useful for heavy work in grinding and polishing machines as well as in some classes of heavy lathe work.

Automatic Operation Reduces Accident Hazard

The more completely stock to be operated on can be moved automatically by power, the greater is the reduction of the accident hazard. An example is in the magazine feed for automatic screw machines by which a new piece of stock is automatically fed into the machine upon the exhaustion of the previous piece.

The fifth seal to be broken for safety is in eliminating the cone drive by substituting a constant-speed belt drive, or better still by using a motor drive. It is generally conceded that the use of a motor drive increases the safety of operating a machine, although it is important that electric equipment should be properly installed and carefully inspected to avoid lurking dangers. As compared with a machine of the same class driven by a belt on a cone pulley, the motor-driven machine

THAT much has been done to make the operation of machine tools safe is pointed out in this article by Luther D. Burlingame, who has been prominently identified with the machine tool industry for many years. He emphasizes, however, that much remains to be done, especially along the lines of educating workmen to use safe methods in carrying on their work. As he aptly says, "It is not that we should guard machines less, but that we should educate for safety more."

*Industrial superintendent, Brown & Sharpe Mfg. Co., Providence, R. I. Abstract of a paper delivered at the annual meeting of the power press section of the National Safety Congress in Chicago, on Oct. 2.

represents a decided step forward in measures for safety.

When a machine is being repaired or oiled, the power should be shut off. Many insist on having the starting device locked so that the machine cannot be started until after repairs or adjustments are completed. Such measures, although some may think them extreme, help to keep safety in the minds of workmen.

Safety is affected by the location of machines as regards daylight and artificial light, aisles, distance from walls, columns, and other machines. Keeping the machine in good repair is also an important means of preventing accidents. The human element must always be reckoned with and is often a greater factor than guarding in preventing accidents. The safety program along this line is, however, intangible, and therefore does not always receive the attention that its importance warrants.

Fool-Proof Guarding Is Necessary

The fact that many operatives who have never before seen the inside of a machine shop are put to work on machines and that because of modern equipment employees with lower mentality as well as of less experience are often used makes the need of "fool-proof guarding" and instruction in safe methods of work more essential if accidents are to be avoided. Training workmen to become "safety-minded" by instruction, by giving them responsibility on safety committees and by the safety leadership of foremen and management are factors in breaking this sixth seal for safety.

When operators handle work where sharp or rough edges are liable to cut the hands, it is sometimes advisable to wear gloves; but generally speaking, the use of gloves around a machine adds a hazard which more than offsets any advantage gained. It is found that an unexpectedly large number of accidents, some being rather serious in nature, result from slipping wrenches. This is often due to the nibs of the wrench being spread so that it does not properly fit. The remedy is frequent inspection and repair of wrenches.

The wearing of caps by women operators of machines is a reasonable requirement to eliminate painful and disfiguring accidents. The wearing of goggles as protection from flying chips, or grindings, should become more and more the established practice.

The tendency of old employees to resist steps taken for their own good is illustrated not only in the use of goggles, but also when the use of safety dogs is required. Such workmen will often hunt up old-style dogs with projecting set screws, perhaps secreted for the purpose, instead of using the modern lathe dog with safety screw. To eliminate from the shop the old and more dangerous type of dog is a way to overcome this tendency.

Most Machinery Accidents Occur at Cutting Point

The seventh seal, which, when broken, will still further lead the way to safety, is in guarding the cutting point, which has already been named as the point of greatest danger. In woodworking machinery a greater amount of study has been given to such guarding, and perhaps for that reason more satisfactory results have followed. Cannot equal study give like results for machining tools? The flying chips from lathe work, the hazard of revolving cutters and drills, the danger from punch presses and shears and from grinding wheels will illustrate. At a machine tool factory, with over 6000 employees, less than one-fourth of the cost of compensation for accidents was for cases involving machinery, but more than three-fourths of the cost which came in this classification was for accidents occurring at the point of cutting, showing the importance of finding means for breaking this seventh seal obstructing the way to safety.

A lathe chip guard, with a glass opening, so that the work may be safely observed, is widely used, but it has limitations for many kinds of work, in fact to a point where its universal adoption cannot at present be recommended. The same can be said about milling cutter guards. Many designs have been brought out and some are satisfactory for use on certain jobs; but so far as known no guard universally applicable for this purpose has as yet been devised. The simple expedient of providing a brush to wipe away the chips so that the conditions of cutting can be seen and strict rules that the fingers shall not be used for this purpose eliminate one of the greatest hazards in milling machines. Another expedient used to advantage is to have a stream of coolant under pressure so that with a hand-operated valve a stream of sufficient force can be thrown against the cutter to clear away the chips. These expedients, however, are palliatives, not cures.

Guarding the grinding wheels is quite general, but a hazard exists for internal grinding for it does not seem practicable to provide a guard which can remain in place. The particular hazard here is that when the wheel is run back out of the work and a gage is used for testing the hole, there is danger of its releasing suddenly and the hand being cut against the revolving wheel. There are designs of guards to protect against this danger by the guard being automatically swung into place in front of the grinding wheel when the latter is withdrawn from the work, thus protecting the workman in case his hand should slip.

Important to Guard Against Flying Chips

Questions of guarding against flying chips, where guarding in the past may have been of doubtful expediency, may, when machine tools are designed for the record-breaking speeds now being experimented with, become of paramount importance. It is also a case where the human element must be given full consideration in order that safety may be insured, these more hazardous operations requiring workmen with steady nerves and superior intelligence, the demand being as great or greater, than in the case of the old-time mechanic, who, while he could produce marvelous results that handicraft skill required, might not be sufficiently versatile to fit himself to the equally exacting, although modern, conditions.

When definite steps to break the seals of safety were taken a quarter of a century ago, the general impression was that the remedy for accidents was for employees to guard gears and other moving parts of machines and that when these first and second seals were broken, the work would be completed. An analysis of accidents soon showed that by far the greater number were not caused by lack of physical guarding or equipment of machines, but were due to other causes, involving carelessness on the part of workmen or laxity in general shop instructions and practices; that, while but 15 or 20 per cent of accidents could be prevented by guarding, the most important effort was needed along the lines of educating workmen and foremen to use safe methods in carrying on their work.

Accidents Reduced 50 Per Cent by Foremen's Cooperation

Over and over again it has been shown that when the foremen's cooperation can be fully enlisted, accidents, even in a well-ordered and well-guarded shop, can be cut in half. It is not that we should guard machines less, but that we should educate for safety more, so that the future may see this sixth seal of safety fully broken and the seventh, having to do with the still greater hazard at the point of cutting, made a matter of intensive study in order that it, too, may yield to the skill of the safety engineer.

Modern Tools Cut Production Time

Centrifugal Compressor Machining and Assembling Reduced
from Three or Four Weeks to Three 8-Hr.
Days by New Manufacturing Layout

CONFRONTED with the problem of manufacturing centrifugal compressors heretofore made by another company for its Centrifugal Refrigeration System, used for cooling theaters and other public buildings, the Carrier Engineering Co., Newark, N. J., has developed a method that reduces machining and assembling time from three or four weeks to three 8-hr. days.

Although the problem involved manufacture of the impellers, impeller shaft and other parts of the compressor or gas pump, description of machining the casing will serve to show the thoroughness and skill with which the entire proposition was handled. Also, this part of the manufacturing problem was, perhaps, the most troublesome, and in the selection and adaptation of machine tool equipment, fixtures, tools and gages, traditional methods were largely disregarded.

As previously made, the pump casing consisted of 28 separate parts that necessitated some 44 machining operations. Being the "neck of the bottle" in the manufacturing process, this casing was closely studied and a way found to cast all parts in each half integral, which permitted machining the two halves in one set-up, thus combining the 44 operations. The redesign also resulted in reducing the number of parts in the labyrinth from 216 to 22. There is but one other machining operation on the casing, final reaming, which is done on a machine using special "combined" reaming tools, after the two halves are bolted together.

The casings are close-grained gray iron castings. Machining operations consist of milling the joints, boring six, seven or eight stages, boring and facing the impeller bearings and grinding the joints—all of which is done at one set-up on the 86 x 72-in., 18-ft. bed, planer-type milling machine illustrated, which was built by William Sellers & Co., Inc., Philadelphia. This machine has one rail milling head, one right-hand side-milling head, a grinding head on the rail, and a boring head that is carried on an extended apron integral with the left-hand end of the cross-rail. Being standard units, the two

milling heads permit use of the machine for other work when the pump casings are not being machined.

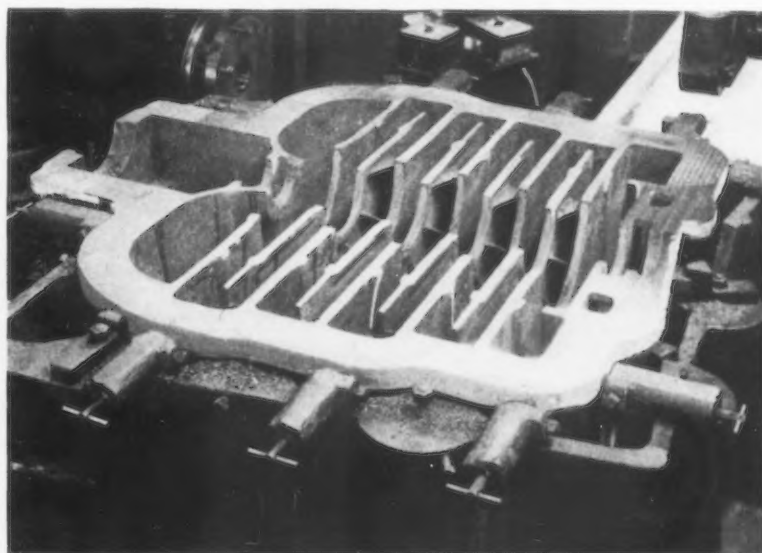
Each half casing is set and locked in a separate fixture, which by means of a tongue and groove is located positively on the table, with relation to the boring head and to the corresponding table locks. The castings are placed joint upward in the fixtures and the first operation is milling this joint. This is done as a standard planer-type miller job, using a 12 or 16-in. inserted blade cutter

in the rail head. One rough and one finish cut is taken, 3/16 in. metal being removed in all.

The next operation, boring out the centrifugal pump stages, is of unusual interest. For this a special Davis boring bar is bolted to the boring head faceplate and supported by outboard bearings fastened to the cross-rail, as shown. This bar, which is 7 ft. long and weighs more than 2000 lb., is made up of a number of integral disks corresponding to the number of stages in the pump. These disks and the bar proper contain the

cutters necessary to bore and face the pump stages to the exact diameters and thicknesses. The cutters, 86 in all, are removable and are accurately set by micrometer gages, it being possible to remove and grind any cutter without disturbing the others. An idea of the accuracy of this work may be gained from the fact that on this casting, which weighs about 3000 lb. there are 41 dimensions calling for a limit of plus or minus 0.001 in., four calling for a limit of 0.002 in., 18 dimensions calling for a limit of plus or minus 0.0025 in., two requiring a limit of plus or minus 0.004 in., and 51 requiring a limit of plus or minus 0.005 in.

When the boring bar is in place, the table is traversed to the fixed stop opposite one of the castings or fixtures, and is locked in position. The boring head, driven by the rail milling head, is then set for the proper speed and the boring bar is set in motion. The crosshead, adjusted by unusually large screws, is then fed down slowly and steadily, carrying the rotating boring bar with it. When the cutters have been fed into the casting



IN Redesigning with Reference to Manufacture, the Number of Parts in the Compressor Casing Was Reduced from 28 to 2 and Those in the Labyrinth from 216 to 22

the proper distance, the various pump stages, and the end and the intermediate bearings for the impeller shaft have been finish bored and faced to limits required. In this operation the cutters are fed down to a point which is 0.005 in. below the true center line, the gage illustrated herewith being used in this connection.

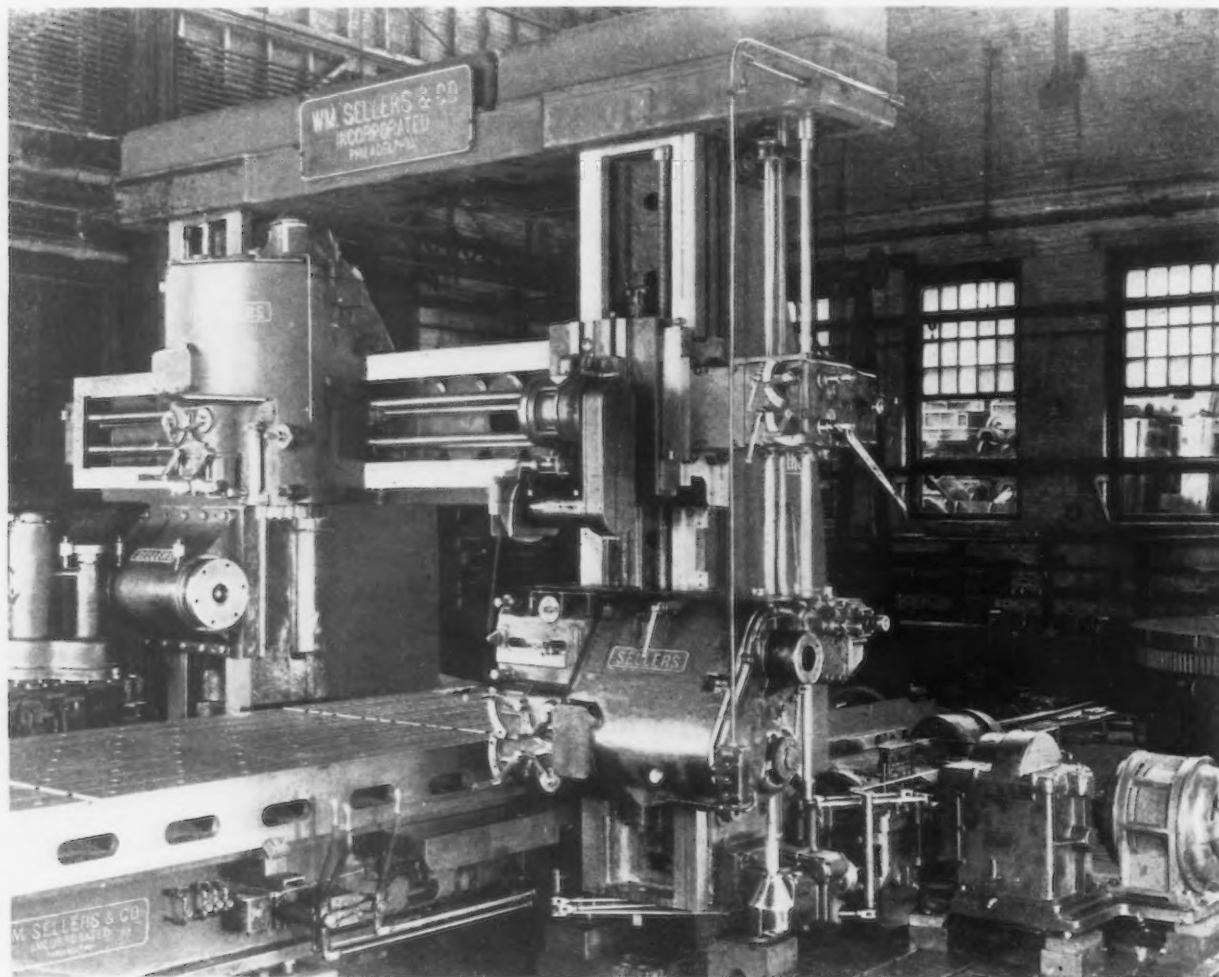
One half being finished, the cross-rail is raised and the table unlocked and traversed to bring the other half of the casing into position, which is bored out in exactly the same manner as the first.

The foregoing boring and facing operations were confined to surfaces of relatively small diameter. A second

in. previously allowed for finish. Length of travel and reversal of the table is controlled as on a planer, except that the speed in both directions is the same. The grinding head is arranged with screw feed across the rail.

Reamer Bar Is 7 Ft. Long, 7 In. in Diameter

The casings are then removed from their fixtures, bolted together and then the bore for the impeller shaft is reamed. After the cases are taken from the machine, the two extreme surfaces which are used to support bearings are accurately scraped to a half-circle gage, which assures the casing being split on the center. They are



IN Addition to the Rail and Right-Hand Side Milling Heads, the Sellers Planer-Type Miller Has a Grinding Head, on the Rail, and a Boring Head That Is Carried on an Extended Apron Integral with the Left-Hand End of the Cross-Rail. Heads have individual motor drive. Control is by push buttons and is completely interlocked

boring operation on the larger surfaces is then performed. For this a boring bar of similar design but larger than the first is employed. It is supported and driven in the same manner as the first, but is revolved at a slower speed.

Casing Joints Ground at Same Set-Up

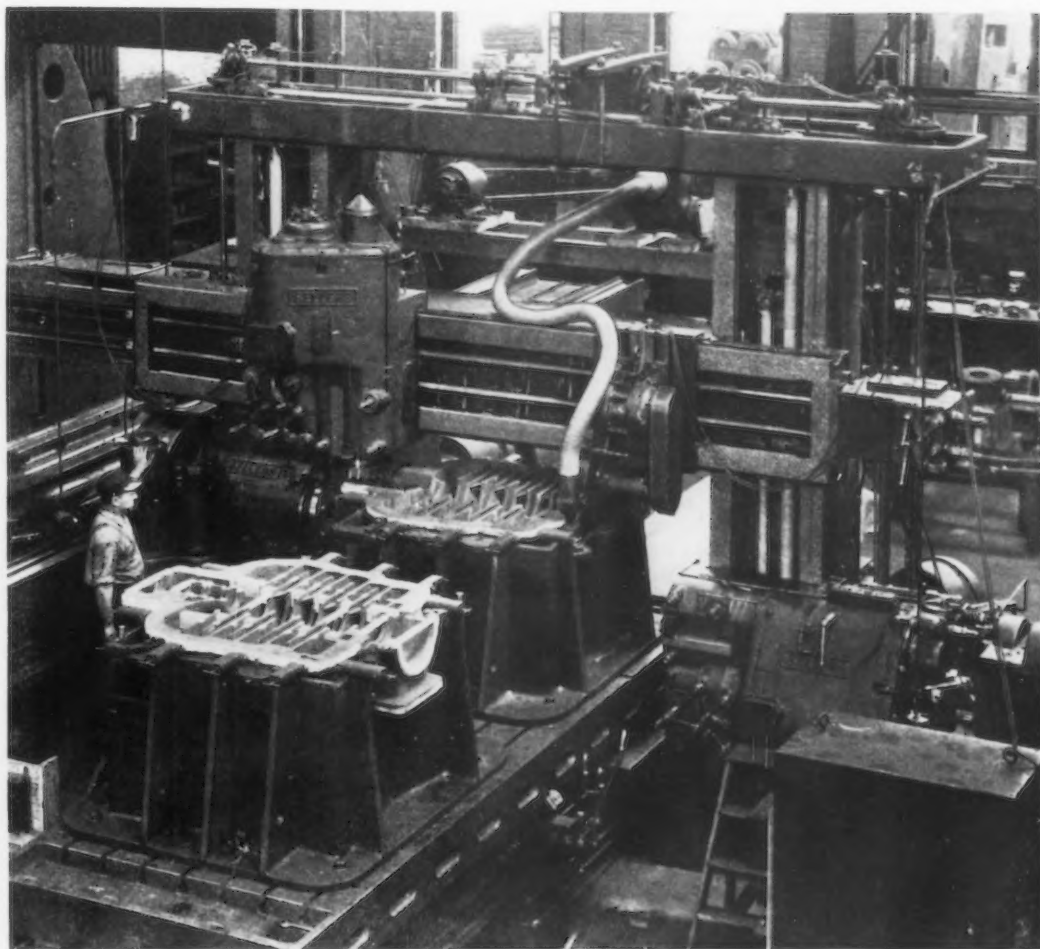
Boring and facing operations on the two halves of the casing now being completed, the casings are then prepared for the final operation on the planer-type milling machine, that of grinding. The fixture clamps are loosened to relieve the castings of strain, the boring bar is removed and the grinding head brought into operating position. Then by traversing the rail and adjusting the grinding head slide, the wheel is set to grind off the 0.005

then joined, with a plug in each end, and the dowel holes reamed; this assures proper alinement of the two outside holes.

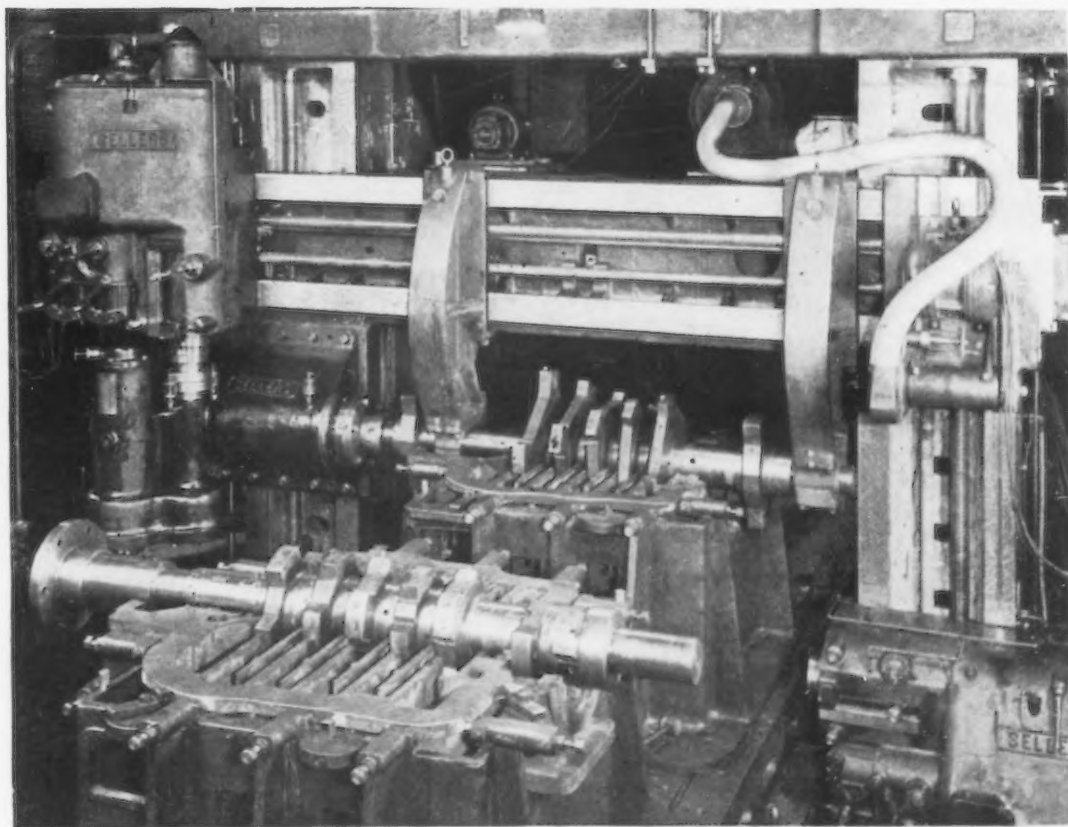
The 7-in. diameter 7-ft. long reamer bar shown herewith is then placed in the case on special bearings which replace the standard bearings used later. It is revolved and fed forward a distance of 2 in., when all the surfaces in the machine are accurately alined and sized; the casing is then ready for assembly.

Planer-Miller Heads Have Individual Motor Drive

The Sellers planer-type miller is a slight modification of the standard machine described at length in *THE IRON AGE* of Nov. 1, 1928. Heads have individual motor drive,



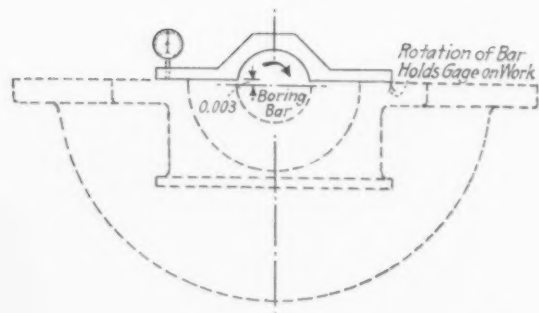
THE Two Halves of the Casing Are Machined in One Set-Up, Except the Final Reaming After the Halves Are Bolted Together. Operations consist of milling the joints, boring the stages, boring and facing the impeller bearings, and grinding the joints. The machine employed is a slight modification of the standard planer-type miller built by William Sellers & Co., Philadelphia



FOR Boring Out the Pump Stages a Special Davis Boring Bar Is Employed. This bar, which is 7 ft. long, weighs more than 2000 lb. and contains 86 accurately set cutters, is bolted to the boring head faceplate and supported by outboard bearings fastened to the cross-rail, as shown



FOR the Reaming That Follows the Planer-Type Miller Operations, a Special Reamer Bar That Is 7 In. in Diameter and 7 Ft. Long Is Used



GAGE Used in the Boring Operation. The boring bar is fed down until the gage rests on the casing—the indicator reading zero—which leaves 0.005 in. for grinding

as described in connection with the standard machine, and 16 different speeds, ranging from 15 to 300 r.p.m., are obtainable through sliding gears and clutches.

The special boring head, driven through a coupling by the rail milling head, utilizes a ground worm and a worm wheel to revolve the horizontal boring spindle. It has a range of speeds from 1 to 20 r.p.m., obtained through the gear changes in the milling head. The grinding head is equipped with a 12-in. wheel which is mounted on a horizontal spindle and driven by a 5-hp. motor through Texrope drive. Both the motor and the grinding spindle are mounted on a slide for fine adjustment.

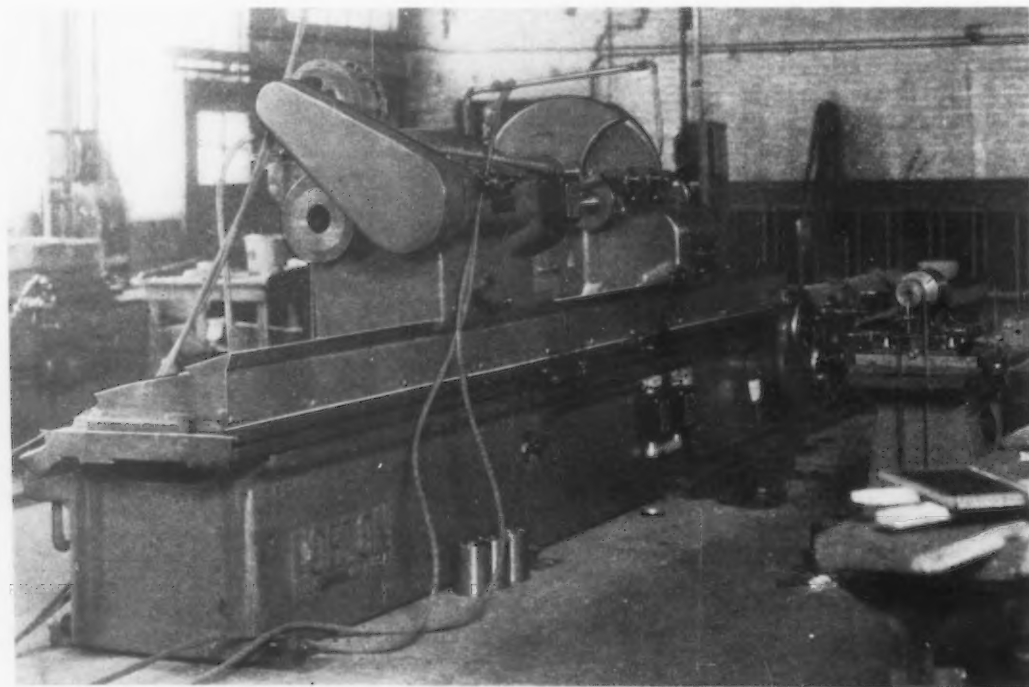
The extended back type cross-rail, the deep box table carried on one flat and one double-vee way, the table drive and bed construction are the same as in the standard machine. A change gear box and rheostat provide the necessary feed range and rapid traverse, this type of drive being said to assure the steady feed so essential to smooth and accurate finish.

All motors are controlled by push buttons from panels

located on both sides of the table, which arrangement makes it unnecessary for the operator to move from one side of the machine to the other to start, stop or reverse the motors. Control of the machine is completely interlocked; feed motors cannot be started in advance of the cutter motors; overload on the cutter motors will slow down or stop the feed as occasion demands. Safety clutches are added as precaution against abuse.

Impeller parts are die formed, the material being stainless steel of special quality. When the impellers are assembled on their shaft, the entire assembly is mounted in the massive 36 x 144-in. special Norton grinder illustrated, which finishes all revolving surfaces. Following this the impeller unit is dynamically balanced.

The grinder, designed for unusually large diameter work, is similar to the standard 28-in. Norton machine, except that the wheel-slide is hydraulically operated and controlled by one lever at the front of the machine. A separate motor is used for driving the hydraulic mechanism, and another motor for the lubricant pump.



WHEN the Impellers and Shaft Are Assembled, a Special 36 x 144-in. Norton Grinder Finishes All Revolving Surfaces. The unit is then dynamically balanced

"Courageous Spending Needed in Industry"

Charles F. Abbott of American Institute of Steel Construction
Says It Is "Wasteful to Be Penurious"

IT is no extravagance to spend money largely, but rather it is wasteful to be penurious, declared Charles F. Abbott, executive director, American Institute of Steel Construction, in an address before the National Industrial Advertisers' Association, which is meeting this week in Cincinnati.

Industrial and commercial success, Mr. Abbott said, has been predicated upon a courageous expenditure of funds and a willingness to be generous in all worthy efforts.

Mr. Abbott went on to say:

"Today successful businesses are conducted on an entirely different plan from that which prevailed in the pre-war days.

"To manage a business successfully requires as much courage as that possessed by the soldier who goes to war. Business courage is the more natural because all the benefits which the public has in material wealth come from it.

"The problem of sales management is far more important than it ever was. We must not only teach our salesmen how to sell, but, what is of greater importance, we must teach the public how to consume.

"In the past, business has been operated on what we may call the economy principle, the principle of paring down and of saving; and it has a wonderful and worthy background. America would never be what it is without it.

Creative Spending Policy Needed

"But as this policy has had to pass; as we now understand that the hold-tight, spend-as-little-as-you-can principle must give way to a new more constructive and aggressive outlook—so business is now beginning to emphasize the principle of creative spending rather than that of pinching economy. We feel it in our family, in our business, and in our national attitude.

"We do not need the old quality of caution today nearly so much as we need the new, the courage to plan and chart enterprise. In days when panics were just around the corner we naturally needed a great deal of caution and watch-dogging, but the panics of business are gone.

"We now have bigger things than merely guarding what we already have. We have a vast creative job ahead of us to raise the standards of living of the 73 millions of people who still exist at or below the minimum comfort level.

"We now know that if we are selling industrial equipment our market

is limited by the sales of our customers to the public. If they could sell more we could sell more to the factories; therefore the need of studying conditions that underly consumer buying.

Discarding Old Economic Ideas

"We are discarding the old economic idea that business is limited and that we must fight like three dogs over two bones to get it. We are realizing that an industry full of unequal units—some very modernly tooled and some poorly tooled; some using up-to-date methods and some ancient methods; some practicing enlightened principles and some practicing unwise principles—need not be accepted with no change possible, simply as the way fate deals out the cards.

"We know that something can and must be done about it. We must lift up an entire industry toward a higher average in tools, methods, and business principles. We are willing to spend money to accomplish it—a great deal of money, individually and collectively. That is courageous and creative spending, the statesmanship of consumption, and genuine progress.

"Cyrus Curtis, head of the Curtis publishing interests, once said he had an executive in his employ whom he had to discharge *because he could never teach the man to spend enough money!* The man had been trained in the old school where all the credit went to the man who *saved* the most.

"When the time came for a decision to spend \$100,000 of Cyrus Curtis's money, promptly and effectively, this man's hand trembled, he procrastinated, and the business suffered. Of course, some other man, even more incompetent, might have spent too lavishly and thoughtlessly. What was needed was a well balanced, keen-minded man who knew how to spend creatively; a man who would decide promptly and courageously, and then spend.

An Example of Courageous Spending

"No better illustration of courageous spending exists than that of Ray Smith, president of the A. O. Smith Corporation, Milwaukee. With nothing but an idea, about eight million dollars was appropriated and expended before the idea was found to be practical. A great deal of courage and a lot of money were required, but the production of automobile chassis was increased from a few hundred to 10,000 a day. At the same time the manual staff was decreased to a fraction. Four hundred

engineers engaged in research made possible another reduction in the sales force and only eight are now required to dispose of the output. To go a step further, the same enterprise was shown in the development of welded steel pipe, with the result that 26 miles of pipe a day can now be produced. Simultaneously other plants engaged in producing automobile chassis and steel pipe were rendered obsolete, unable to compete with such remarkably low costs. Without the courage and the spending as inaugurated by this one man the public would never have received the benefits of these unusual results in cost reductions.

"Instead of the hang-on-to-the-dollar type, there was needed the spend-plenty-of-money-promptly-on-competent-analysis type. The old guiding general principle was saving; the new principle is construction. Both are wonderful, useful American traits, but right now we need the latter type.

Predicts Many More Mergers

"Business is now being transacted on a large scale because our people have the income which makes large scale consumption possible. Small business units cannot successfully serve such a public demand. There have been nearly 2000 mergers in the past two years. More are to follow because it is the large organization that alone can meet efficiently the problems of distribution that modern conditions are creating.

"Where smaller units of industry can operate economically in the field of production they are organizing into institutes and similar associations in order that they may take advantage of the economies possible through co-operative effort in the field of distribution.

"These organizations, as well as co-operative merchants, are successful only so far as men can be found who can operate them, men who understand big-scale spending, men who can courageously authorize creative advertising appropriations running into millions of dollars and conduct their affairs with the greatest economies; men who can competently make big decisions and make them promptly when the necessary facts are in, and if the facts are not in, then go out and get them. That is the modern research technique which molds the judgment of the courageous spender.

Plan for Tomorrow's Profit

"We have already learned, as Carnegie taught us in the steel industry,

that our plans should be for tomorrow's greater profit. This is what should govern our spending today—not what we did or spent last year. Carnegie scrapped one steel process after another, sometimes before the shine was off the million-dollar equipment, simply because he was investing in greater future profits and a greater competitive advantage. By doing so he plucked the steel leadership right out of England's hands, never to return.

"The steel skyscraper has done the same. So profitable is this creative process that we are tearing down modern buildings, only 10 or 12 years old, to erect others in their place which will make more money for the owners. A man who owns a 12-story building, fairly modern and built 10 years ago, standing on ground rapidly becoming more valuable, finds that he is unable to get out of that building a proper return on the increased valuation of the land, or as large a return as possible. But that is not all. His tenants cannot get the up-to-date elevator service, office standards and comfort from the building erected 10 or 12 years ago, so rapid has been our advance in building conveniences.

"Exactly the same holds true of the manufacturer who decides to own a modern plant. He might believe that he could continue to manufacture in his old tumble-down factory, erected before modern ideas of routing or sanitation were known. But if he considers the cost of handling materials, and his engineers make full use of every new tool, new method and new principle; reducing labor to a minimum and applying the latest equipment, the manufacturer will undoubtedly find that he has been paying an immense premium every year to remain in the old plant with the old equipment.

"It all figures down to an engineering and mathematical basis. Here lies the big task of tomorrow for all industrial advertisers—to sell the idea of creative spending, and even of creative wasting, to more people.

A Need for Bold Spenders

"We need bold, determined, aggressive spenders; daring but cool; risk-taking, confident, even colossal spenders. Does this sound startling? Don't be afraid. Carnegie was called a colossal spender because of his fast scrapping policy, but Carnegie literally set the modern American industrial pace.

"In our keen interest in Ford and the automobile industry we forget that the steel industry in the United States really took the lead and changed the entire program of American industry.

"Carnegie was the Ford of yesterday, and with his scrapping policy he laid the foundation on which modern business rests. He introduced a new kind of dynamics into business—speed, punch and courage to go forward, whatever the cost in waste, if the engineering facts pointed the way.

He introduced the line and staff organization and respect for experts and for research.

"It is no accident that the present has been called the steel age. Steel not only holds up our great skyscrapers, but the history of steel is the history of industrial America.

"We need men who will go around a factory or an office with just the same determined look and say 'Out with it—I don't care what he says!' We may dislike to see the junk man make much money, but take it from me, for every dollar the junk man makes, we would make a thousand.

"Hanging on to old, out-moded goods is a terrific brake on progress. A man once said to me 'I have a suspicion that any city would be better off if an earthquake came along every 10 years and shook to pieces everybody's factory, office and equipment. It seems as if nothing but an earthquake could ever make some people wake up to their need for up-to-date equipment. Did you ever notice how vastly improved and more efficient and prosperous a city is that has had an earthquake or a flood or a fire?

"There's no mystery about it—everybody buys new equipment, business is brisk, and production is increased because the tools are better. And why shouldn't everything be much better? It is new and up-to-date."

A Job for Industrial Advertising

"Industrial advertising interests should assume the greater part of the burden of teaching courageous spending. You must do the educating. It is a big task to break down habit and general outlook on life, which is the real problem that stands in the way, but it can be done.

"It is often easier to sell a man a yacht, which will prove to be a big expense to him, than it is to sell him a profit-making idea of value to his business. We must never let up in our fight, because our industries will suffer by comparison if we do. We cannot lag behind in this fast, modern pace.

"Only the man who is sure of his results is courageous in his spending. He has no doubts as to the outcome. The steel industry has produced some such men, though it still is in need of developing a better public consciousness. 'As hard as steel' is quite generally recognized, but that does not improve the standing of the material in the eyes of the public. If, instead, we could get people to say 'as fine as steel,' we would be accomplishing something. But to do that would require a real advertising appropriation.

Cites George M. Verity's Policy

"George M. Verity is a good example of the courageous spender. 'Go ahead and try' was his slogan in August, 1914, when Armco iron was first produced. His policy was to go ahead and find out what the buyer wants, go ahead and find out how best to produce it. Go ahead and do.

Go ahead and tell. He coordinated his selling plans with his production—he did not hesitate to discard the supplanted machine. He has kept as a permanent asset the first 'go ahead' order.

"By advertising to the employee, the stockholder, and the public, as well as to the ultimate consumer, the American Rolling Mill Co. has developed a consumer acceptance for a raw material. It has not hesitated to continue advertising even in a notorious sellers' market because it wished to retain the good will of its customers. It has engaged in collateral advertising to promote the sales of the fabricator of its material. Such advertising has lifted Armco iron out of the rut of raw products, and placed it in the forefront of consumer thought. It has been expensive, but it has more than paid dividends. That is what I call courageous spending.

"In the whole field of advertising media there are no more important publications to be considered or more thoroughly deserving a larger part of the appropriation than the trade and industrial publications. They form the very basis for the essential educational effort so necessary if the industry itself is to be advanced. They blaze the trail for creative spending because they speak for the industry and thereby assert its leadership. The public is recognizing more than ever before that trade publication advertising is the real, dependable source of information.

Doing a Better Job in Advertising

"We are doing a greater and better job in advertising than we ever dreamed of doing in the old days. It is costing more money, but it is breaking down resistance, promoting bigger things because it is genuinely creative spending.

"The technical and industrial field is rapidly coming into the bigger sphere of usefulness, and he is a bold man who can predict where this era will end. A single advertiser today probably spends as much as the entire industry did in the old days when industrial advertising was looked upon solely as a handout, or as mere good will or institutional advertising.

"I have an idea that 10 years from now, perhaps less, we will look back even on today as mere pioneering in the bigger things to come in creative spending. But I am also sure that your organization will continue to be, as in the past, at the very tip of the forefront of the advance."

An International Heating and Ventilating Exposition will be held in the Commercial Museum, Philadelphia, under the auspices of the American Society of Heating and Ventilating Engineers, Jan. 27 to 31, 1930. President Thornton Lewis of the society has named an advisory committee and a cooperating committee for the exhibition, and Charles F. Roth, Grand Central Palace, New York, is manager.

Knee and Column Type Miller

Ease in Changing Feeds and Speeds a Feature—Plain, Universal and Vertical Units Made

AN improved and simplified method of changing speeds and feeds, and independent directional control levers for cross, vertical and longitudinal movement of the table, are features of the new No. 3 Cincinnati knee and column type miller which has been placed on the market by the Cincinnati Milling Machine Co., Cincinnati. This machine is being manufactured in the plain, universal and vertical types, operated by belt or inclosed chain motor drive.

Change in speeds and feeds is made convenient by means of an automatic power shift for the spindle speeds as well as the table feeds, controllable from either the front or rear of the machine. To change speeds the operator disengages the starting lever, throws the speed and control lever *E* (or lever *C* if working from the rear) to "Speed." The speed dial *B* rotates while the lever is in this position. When the speed desired on

colored dial *B* appears opposite the arrow, the operator releases control lever *E*, pushes starting lever *A* away from the column, brings it back and then pushes it up.

To change feed, the operator throws speed and feed control lever *E* (or lever *C* if working from the rear) to "Feed" position on the plate. This lever is held on this position until the desired feed on the colored dial *D* registers with the arrow and is released. It is claimed that the ease with which these changes can be made will result in the operators being more likely to change the feed and speed demanded by the cut, thus giving greater production and a higher quality of the milled surface.

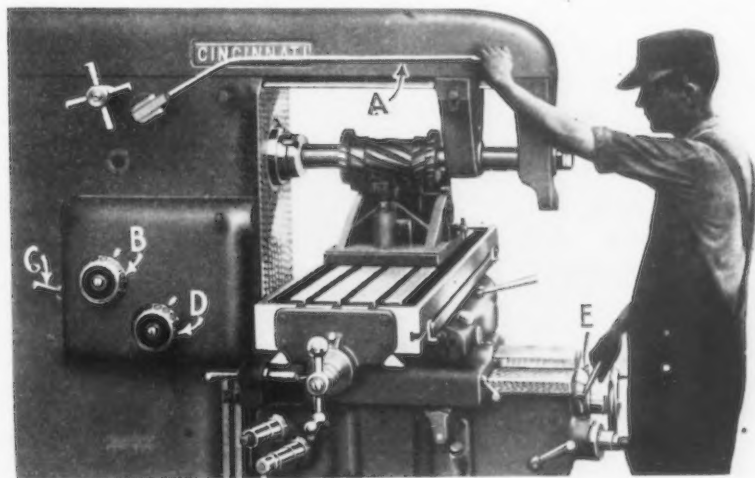
Every movement of the machine's table has a power rapid traverse, in addition to the power feed, operated from either the front or rear. The rapid traverse is available with the spindle either stopped or running.

Rapid traverse rates are: Longitudinal, 100 in. a minute; cross and vertical, 50 in.

Illustrations show the operator taking a cut, with his right hand on the directional control lever and left hand on the power quick traverse. To rapid traverse out of the cut, he shifts the feed lever in the opposite direction and pushes down on the power quick traverse lever. It is necessary for the operator to hold this lever in position; as soon as he releases his hand, it clicks into feed. The rapid traverse for the table on the plain machine can be automatically disengaged by dogs on the side of the table. In such case, however, the operator holds the power quick traverse lever in position.

Hand adjusting cranks at the rear as well as at the front of the machine are provided for getting accurate cross and vertical adjustments. New micrometer dials, easily read, provide for accurately getting the desired hand feed.

The Cincinnati double mounting of anti-friction bearings at both the front and rear of the spindle, with a floating rear bearing, are used on this new machine. New proportioned



SPINDLE Speeds and Feeds Are Changed from Front by Power. To change speed, operator (upper left) pulls outward on starting lever and shifts lever at front of knee. Front independent directional control of table, knee and saddle movement and power quick traverse are features of machine. Operator (lower left) is taking cut with right hand on directional control lever and left on power quick traverse. Rear control of hand feeds is illustrated (lower right) by operator making accurate cross adjustment from rear with hand adjusting crank having large micrometer dial



gears slide on heat-treated spline shafts. Gear contacts in the spindle drive have been reduced, giving four on the forward and five on the reverse, thus making a positive direct drive. The rectangular overarm has been increased in size and the two arbor supports are made of aluminum, with automatic lubrication provided for the bearing collars.

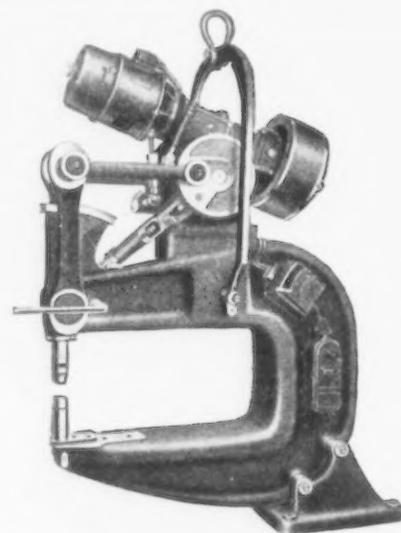
A cutter coolant pump having a capacity of 8 gal. a minute is supplied as standard equipment. The mechanism within the column, including the spindle drive, runs in a bath of oil supplied by a gear pump inside the column. A pump located in the knee automatically lubricates the knee, while the saddle and table are lubricated by a one-shot oil system at the left end of the saddle.

The leadscrew construction has been improved and the elevating

screw—a single piece screw—has been substituted for the sleeve formerly used. The general proportions of the knee, column and other parts have been increased in dimensions. In addition, narrow guides and new type gibbing have been provided.

The table has a working surface and a size overall of 15 x 62½ in., with three 13/16-in. T-slots. The table on the universal type swivels 45 deg. The longitudinal range of all three types is 34 in.; the cross range of the plain and universal machines is 12 in., and the vertical type, 16 in. The vertical range on the plain type is 20 in., the universal 19 in. and the vertical 12 in. The machine is operated by a 7½-hp. motor running at 1720 r.p.m. The floor space occupied by the plain and universal types is 106 x 113 in. and by the vertical type 90½ x 113 in.

of throat ranges from 1 ft. to 13 ft. 2 in. The machine will work in any position. Special types of hangers, or bales, such as swing cradle hangers, that permit sideways tilting of the machine, semi-universal or full universal hangers can be furnished. The flywheel, which runs at 1000 r.p.m., is connected by friction to the main driving shaft, and is disconnected automatically in case of overload. The motor starter is mounted on the yoke-frame, just below the flywheel, and the main switch, fuse box and socket



From the Motor the Drive Is Through Worm and Worm Wheel to Driving Disks That Are Connected to the Toggle Levers. Motors range from 2 to 7½ hp. and working pressures from 27 to 145 tons

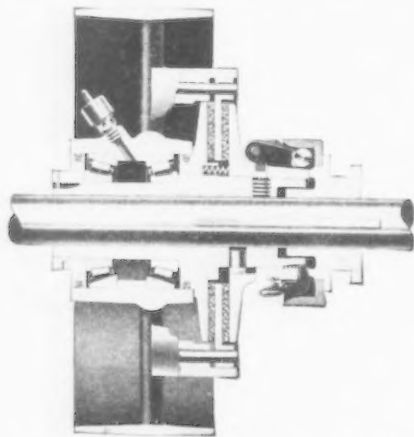
for the cable connecting block is mounted on the side of the frame, as shown. A detachable foot that adapts the machine for stationary use is provided.

The net weight of the smallest machine ranges from 1540 to 6270 lb. and the weight of the largest from 10,560 to 42,900 lb.

New Edgemont Disk Clutch

EASE of adjustment is a feature of a new disk clutch designated as the type SF which is being marketed by the Edgemont Machine Co., Dayton, Ohio, for a variety of applications, from countershafts to machines of all kinds. It is designed for transmitting either low or high speeds and for either slow and easy or quick pick-up of the load.

The mechanism is provided in a complete line of pulleys, with either oil-sleeve bearings, Timken roller bearings, and Fafnir transmission ball bearings. They are also made in extended sleeves, on which pulleys, sheaves, gears, etc., can be mounted. The mechanism alone can be fur-



Single Adjustment, Made With One Hand and Without the Use of Tools, Is a Feature

nished to those desiring to make their own mountings.

Adjustment of the clutch may be made with one hand and without tools; it simply requires pressing down on a lock lever and turning the adjuster until the lever snaps into the next slot. Renewable asbestos metallic liners of large friction area are used, and the steel cam and rollers are hardened to assure long life. The design is such that it is impossible for centrifugal force to engage the clutch

or cause dragging at any speed. Levers push on the plate without sliding action, thus eliminating wear at this point. The clutch is easily operated, rollers in long levers, and there is no sliding under heavy pressure. This permits the machine to be inched along.

Electro-Mechanical Riveting Machine

SAVINGS in power consumption, reduced maintenance expense, and high working speeds are claimed for the electro-mechanical toggle-lever riveting machine, known as the L. M. G., which is being marketed by the United Machine Tool Corporation, 75 West Street, New York.

The machine is entirely self-contained and is said to drive up to 24 rivets a minute. Seven sizes are built, the capacity of the largest and smallest machines being as follows:

	Type EKN II	Type EKN VIII
Working pressure, maximum	27 tons	145 tons
Boiler rivets, maximum	5½ in.	15½ in.
Structural rivets, maximum	3½ in.	4 in.
Stroke	2¾ in.	4¾ in.
Size of motor	2 hp.	7½ hp.
Hp. required for no load	0.8	1.5

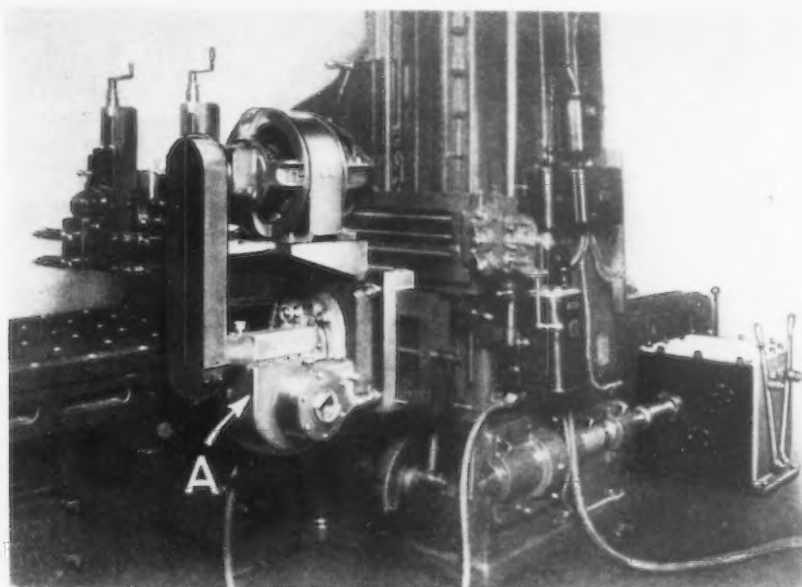
Arrangement of the machine may be seen in the illustration. From the motor, the drive is through a steel worm and phosphor bronze worm-wheel, contained in a housing between the motor and the flywheel, to a set of driving disks that are connected to the toggle levers. Between the worm-wheel and the driving disks there is a clutch that is controlled by a handle just above the upper jaw of the yoke frame. The machine can be adjusted to operate continuously, or so that the plunger stops at the top and the bottom of each stroke, permitting the rivets to cool under pressure as long as desired. The plunger is adjustable.

The distance between the jaws is regularly 15¾ or 19¾ in., but other heights can be furnished. The depth

Harnischfeger to Expand

The Harnischfeger Corporation, Milwaukee, manufacturer of excavating machinery and electric traveling cranes, has announced a change in its financial structure by which the present common stock, consisting of 40,000 shares of no-par value, will be increased to 500,000 shares. Seventy-five thousand shares are being offered to the public through Otis & Co. and the First Wisconsin Co., Milwaukee. Approximately \$2,000,000 of the fund provided by the new financing will be put into a two-year expansion program which will result in an increase of 50 per cent in the company's capacity.

The Northern Blower Co., Cleveland, has installed its Norblo dust collecting equipment in the plants of the Crucible Steel Casting Co., Lansdowne, Pa.; Rensselaer Valve Co., Troy, N. Y., and the Florence Pipe & Foundry Co., Florence, N. J.

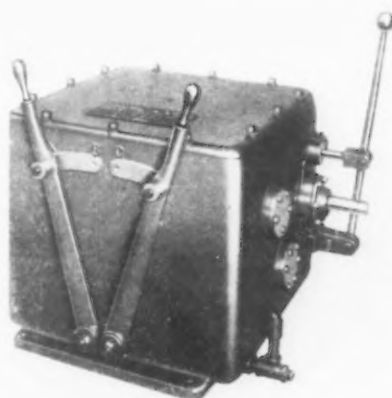


Milling Head for Use on Planers

AN improved milling machine head for planers is being manufactured by the Adams Co., Dubuque, Iowa, in three sizes. Although the illustration shows the head, A, mounted on the side rail of a Cleveland open-side planer, the same equipment can be used as a rail head, and an outer bracket can be supplied for supporting the end of horizontal arbors.

The drive is by means of a hardened steel worm engaging a phosphor-bronze worm wheel on the spindle, both the worm shaft and the main spindle being mounted on precision type Timken bearings. The head can be swiveled to any angle and consequently can be used for horizontal, vertical or angular milling. The saddle shown is made with an overhanging bracket to support an electric motor which drives the worm through silent chain and sprockets. A plain saddle and countershaft equipment can be supplied for the belt-driven unit.

The special gear box shown in the separate illustration was designed to provide the necessary reduced table speeds for milling. The shafts are multiple splined and are mounted on



Milling Head Applied to Side Rail of Open-side Planer. The special gear box, shown above, provides suitable table speeds for the milling operation

Timken bearings; the entire mechanism runs in a bath of oil. When planing operations are to be performed, throwing in of the clutch lever couples the driving and the driven shafts, and with the clutch out of engagement, a variety of milling speeds is available through the sliding gears. Any series of speeds can be provided, to meet requirements.

Die Maker's Reamers

AREAMER having a taper of $\frac{1}{4}$ -deg. included angle, or approximately 0.013 in. per in., is being made by the Morse Twist Drill & Machine Co., New Bedford, Mass., for use by die makers.

In laying out a die, holes can be drilled close together, thus outlining

the shape desired, then reamed by the taper reamer until the holes run together and the central piece drops out. The tool can then be used on the outline of the die edge as a spiral mill, the resulting clearance being correct for the finished die. The larger sizes of these reamers may be used for profiling.

Rapid action and absence of chip



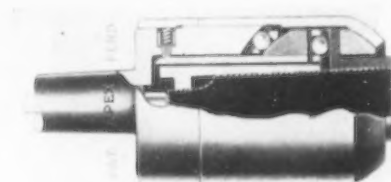
Having a Taper of 0.013 In. Per In., the Reamer is Suitable for Die Work

clogging are features emphasized. Freedom from breakage is attributed to the fact that the easy shearing cut imposes little strain upon the cutting edges. Reamers with other tapers and in special lengths, both high-speed and carbon steel, can be furnished. Twenty-three sizes of the die makers' reamer, which is designated as the No. 678, are regularly made, the smallest having a diameter of 0.058 in. at the small end and 0.073 in. at the large end. The corresponding diameters of the largest tool are 0.443 and 0.518 in., respectively.

Full-Floating Tool-Holders

IN the full and semi-floating tool holders recently brought out by the Apex Machine Co., Dayton, Ohio, angular float is obtained by the upper row of balls and parallel float by the lower rows; in each case there are two rows at right angles. The balls operate in hardened and ground grooves, and in addition to producing a free floating tool, they minimize friction. The semi-floating holder has parallel float using only the lower row of balls.

In using the device in connection with reaming, the holder permits the reamer to follow the hole, correcting for misalignment between the work and the spindle or turret, and thus eliminates bell mouthed and tapered



Angular Float Is Obtained by the Upper Row of Balls and Parallel Float by the Lower Row

holes. Holes may likewise be tapped true to size.

An inserted socket type of this tool, having little overhang and adapted particularly for hand screw machines and automatics, is also manufactured.

Two continuous pack-heating furnaces for finishing high-grade sheets are to be installed by the Wean Engineering Co., Warren, Ohio, in the plant of the Michigan Steel Corporation, Detroit. Two similar furnaces are reported by the Wean company to have been erected at the Empire Steel Corporation in the record time of six days each. The Michigan order brings the total number of furnaces of this type in the United States to 62.

Pennsylvania Fabrication Co., Verona, Pa., has taken over the structural steel fabricating plant of the Bollinger-Andrews Construction Co. at that point and plans to begin operations this week. The latter company went into receivership a year ago.

Lining Tanks with Lead Strips

Method of Attaching Sheet Lead in Non-Homogeneous Coating Said to Save Cost

LEAD linings are being applied to tank car tanks by an interesting method, devised by the Gross Lead Burning & Coating Corporation, 3955 West Twenty-fifth Street, Cleveland, which is an adaptation of the lead-coating process developed by this company and described in THE IRON AGE, April 7, 1927. In the Gross

surface that is to be coated, forming a skin base. A homogeneous coating of lead is then put on by means of a burning bar and oxy-acetylene torch. However, the expense of applying the coating was an objection to the use of this process for the homogeneous coating of large tanks. By the method adopted it is stated that the cost has

bands $\frac{1}{8}$ in. thick by 2 in. wide, extending the length of the tank, were applied lengthwise on the inside by the Gross method, and lead sheets were attached to these bands, the edges of the sheets being the only points of adhesion.

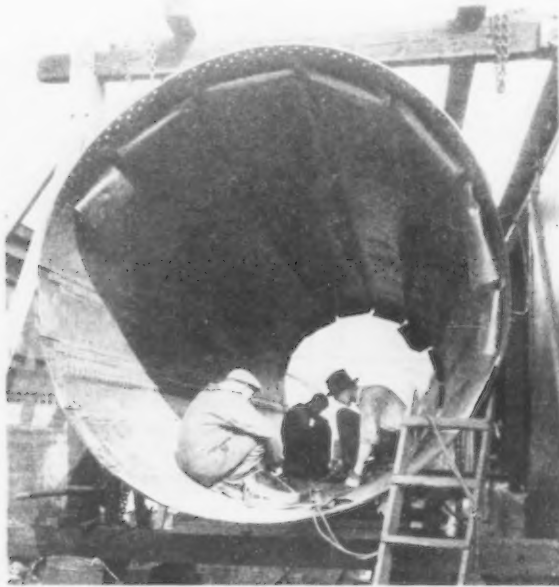
Lead Bands Burned On

First the surface of the tank was cleaned by grinding. Then the outside of the shell was preheated opposite the narrow strips that were to be coated to form the bands, and the skin base was applied. Then the bands were burned on. The bands are on 15-in. centers on the upper half of the tank and on 30-in. centers on the lower half.

Sheet lead $\frac{1}{8}$ in. thick, which is used for the lining, was cut to the proper width to butt against the sides of the bands. The edges of the sheet were then burned to the bands, seams $\frac{1}{4}$ in. deep being made at the point of contact, assuring a strong adhesion of the sheets to the bands. After the inner circumference of the shell was lined, the heads were lined with $\frac{3}{16}$ -in. sheet lead burned to vertical homogeneous bands 2 in. wide placed on 15-in. centers. After the heads were lined, they were riveted in position, and the ends of the sheet lead in the shell were lapped over the rivets and burned to the sheet lead in the head.

This method of lead lining, while regarded as satisfactory for tanks for certain uses, is not recommended where the working temperature inside the tank is 200 deg. Fahr. or higher, or in tanks in which a high vacuum is created.

The lead-lined tank cars are being built for the Champion Coated Paper Co., Hamilton, Ohio, for handling acids. This company's processes require that the acids inside the tanks be free from stains caused by iron and steel, and that the tanks be protected from corrosion.



SHELL of 10,000 Gal. Tank Car, with Heads Off, and Operators Burning in the Lead Sheets. As shown, the tank is inverted, the dome being at bottom

process a liquid lead flux made from a formula developed after long experimental work is used, in place of the usual solder flux. An advantage claimed for this flux over ordinary soldering flux is that coatings applied with its use will withstand heat and acids.

Ordinarily the flux is applied to the

been reduced to one-third of the cost of a homogeneous coating.

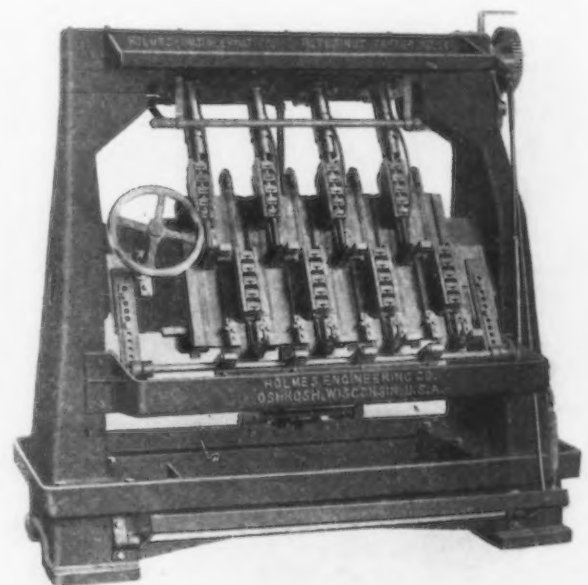
The tanks being lead lined are for standard 10,000-gal. tank cars. They are 9 ft. 6 in. in diameter and 28 ft. 6 in. long, fabricated of tank car specification steel plates. Instead of providing a homogeneous lead lining, a series of strips of homogeneous lead

Precision Claimed for Tilted Nut Tapper

THE Holmes Engineering Co., Oshkosh, Wis., has brought out a new tilted nut tapper with features intended to assure tapping square with the face of the nut. Precision is attributed to the 30-deg. tilt of the machine, which permits the nut to lie squarely on its face with no danger of tipping on its side. Secondly, the work-holding fixtures can be made absolutely true, are adjustable and can be lined up with the spindles. These fixtures are self cleansing, so that no chips can lodge at any point. The carriages are counterpoised to eliminate error in lead.

The capacity of the machine, which is designated as the No. 14, is for U. S. S. threads up to $1\frac{1}{4}$ in., and production is at the rate of 20 to 30 nuts per min. The machine may be arranged for belt or motor drive.

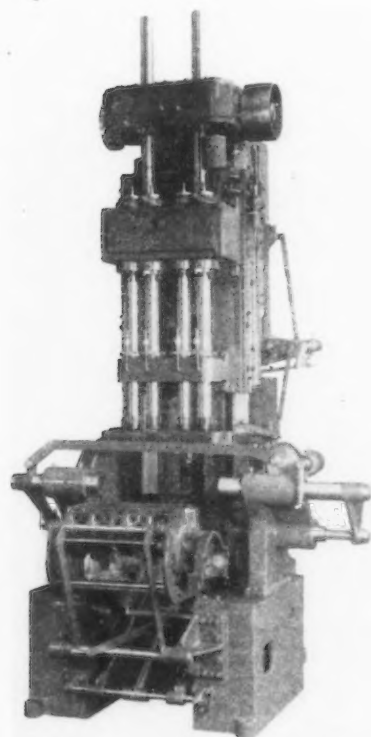
PRECISION Is Attributed to the 30-Deg. Tilt of the Machine, which Permits the Nut to Lie Squarely On Its Face. The adjustable fixtures can be aligned with the spindles, and the carriages are counterpoised to prevent error in thread lead



Cylinder Borer for High-Production Operations

FOR high production on a definite set-up, the Moline Tool Co., Moline, Ill., has added to its line the No. 14 Hole Hog cylinder borer here shown.

The machine deviates from the company's standard practice of having independent spindle units adjustable for center distances between spindles. Timken roller bearings are used for the spindles, and all run-



Cylinder Borer Tooled for Reaming operation on V-type Cylinder

ning bearings throughout the machine are either roller or ball bearings. The illustration shows the machine complete with jigs and tools for reaming a V-type eight-cylinder block.

As in other Hole Hog boring machines, double-V guide construction is used, as well as the Oilgear feed mechanism, with the cylinder located between the vees and the pump inclosed in the column. From the motor, mounted on top of the column, the drive to the main driveshaft is through silent chain. The upper driving mechanism is fixed with respect to the column, the drive from the main horizontal driveshaft to the two vertical intermediate shafts being through hardened steel and bronze spiral gears that run in oil. The two vertical shafts are multi-splined, and on their ends are mounted hardened steel pinions that mesh with the gears on spindles. These gears are also immersed in oil.

The machines are made in pairs, two each for roughing, semi-finishing, and reaming operations, respectively, on the two series of holes. The fixture

can be swung out in line with the conveyor so that the cylinder can be pushed into the cradle jig, and by very little effort in raising the lever at the front and center of fixture, the entire cradle swings into working position. By turning the crank at the right of the fixture, the two locating plungers enter the main crankshaft bearings, and simultaneously the two guide and clamp plungers are brought into position, centering and clamping the block in place.

In all cases, the boring bars are made as long as possible. In the roughing operation they are guided at the top of the fixture, close to the work, and in the semi-finishing operation are piloted both above and below the work. In the reaming operation the guide is mounted on the bottom of the slide and is not piloted directly in the fixture.

Punch Press for Large, Light Work

TO meet the demand for a punch press to accommodate large, light work that is usually handled on a heavier and slower press in order to get sufficient die space and bed area, the Federal Press Co., Elkhart, Ind., has brought out the new machine here illustrated. The press can also be used in the production of parts that require use of progressive dies, and has an opening in the bed which permits dropping through of stamped parts or the scrap from extremely long progressive dies.

The die space, bed to slide, stroke down adjustment up, is 9¼ in. Approximately 2 hp. is required to drive the machine, which occupies 35 x 44¼ in. of floor space overall and weighs 3100 lb. complete.

Pressure exerted by the ram, near the bottom of the stroke, is 26 tons. The standard stroke is 1 in., but a stroke of 1½ in. can be provided. The size of the square hole, for round or square punch shanks, is 19/16 in. The depth of throat, ram center to frame, is 8¾ in., while the distance from bed to gibs is 13 in. The bed reclines 40 deg. from upright. The bolster plate measures 16 x 32 in. and is 1¼ in. thick. The flywheel is 27 in. in diameter, weighs 450 lb. and has a speed of 125 r.p.m. The crankshaft diameter is 2¾ in. at the main bearings and 3 in. at the crank bearings.

For preheating sheet mill rolls at the new works the Newton Steel Co. is building at Monroe, Mich., 24 electric roll heaters will be supplied by the Freyn Engineering Co.

Foundry Riddle with Metal Rim

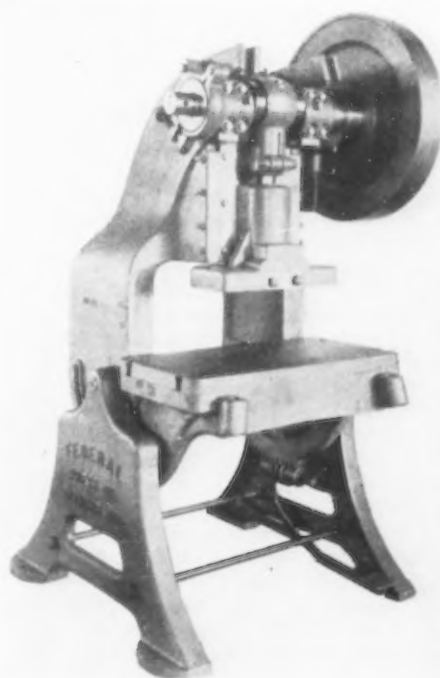
METAL-RIM riddles with removable bottoms have been brought out by Rolock, Inc., Southport, Conn., as illustrated. The greatest field for this riddle has been found in connection with the use of gyratory machines. Here it is possible to slip out a used bottom and replace it with a new one in a few seconds, instead of taking considerable time to remove



Separate Bottom with Metal Rim Makes This Riddle Easy to Replace in a Gyratory Machine

the complete riddle, as formerly was necessary.

Stocking of riddle bottoms of different meshes is facilitated in a minimum of space by the fact that the bottom and rim are separate. There are three sizes made, one for the gyratory machine, the others being 16 and 18 in. in diameter respectively.



Press Designed for Production of Light Material of Large Size and Parts Requiring Use of Long Progressive Dies

Multiple-Hearth Rotary Furnace

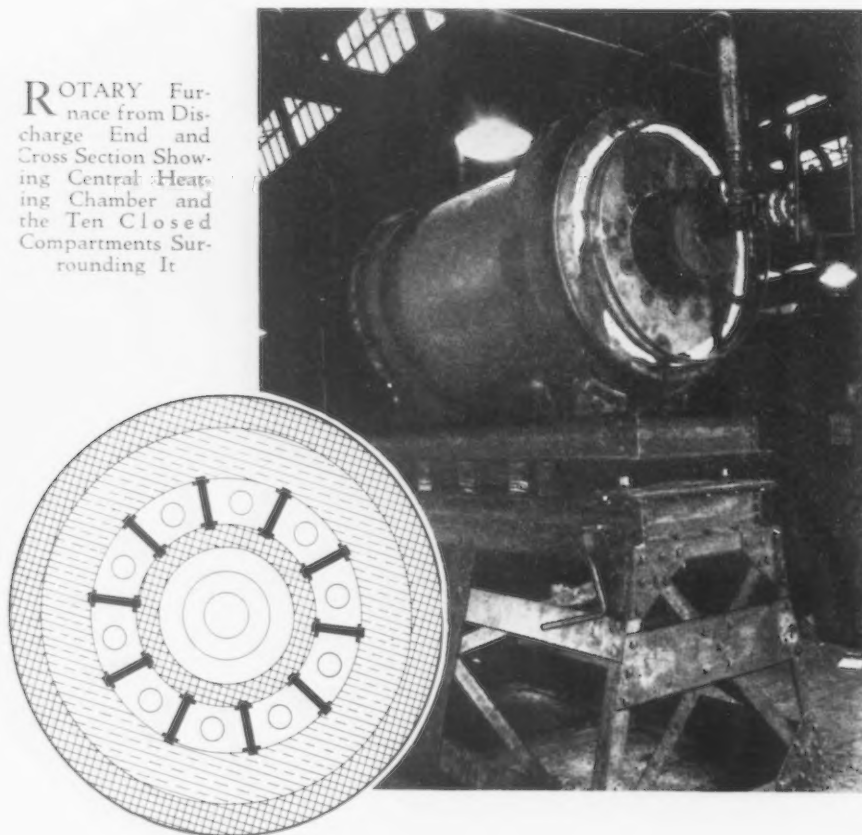
Central Heating Chamber Is Surrounded by Ten Compartments for Holding Work

A ROTATING furnace for bluing, drawing, annealing and heating at temperatures from 700 to 1650 deg. Fahr. has been brought out by Strong, Carlisle & Hammond Co., Cleveland. The furnace illustrated was built for heating $1\frac{1}{2}$ x $2\frac{1}{2}$ -in.

ing material; outside is the steel drum which forms the outer covering of the furnace.

The furnace barrel and drive is mounted on a frame, hinged to the structural steel base at the loading end. This permits the drum to be

ROTARY Furnace from Discharge End and Cross Section Showing Central Heating Chamber and the Ten Closed Compartments Surrounding It



brass billets, and has a capacity of 20 lb. per min., work heated to 1300 deg. Fahr.

As shown by the cross sectional drawing, a combustion chamber 12 in. diameter, made of Carbofrax, extends down the center. Surrounding the chamber is an annular space in which the work is carried. This is divided into either 8 or 10 compartments by $\frac{1}{2}$ -in. partitions of heat resisting alloy. Work is thus carried through a revolving barrel and is brought to temperature by radiant heat, not coming in contact with the products of combustion.

One of the compartments is used for a thermocouple, this section being inclosed at the feed end so the work will not enter. The thermocouple wires connect to the two brass rings shown in the view of the discharge end of the furnace. Contact brushes lead to a temperature recorder.

The outer wall of the heating chambers is built of $4\frac{1}{2}$ -in. Klondyke firebrick, surrounded in turn by insulat-

ing material; outside is the steel drum which forms the outer covering of the furnace. The rate at which the work moves through the furnace, and consequently the heating time, is controlled by the inclination of the barrel axis and by the speed of the driving motor. The heating time can be varied from 5 min. to a maximum of 30 min.

Work is fed into the furnace by an elevator conveyor dumping into a hopper. Mechanical pickers carry the work from the hopper into the heating sections. As the drum rotates, the work not only moves toward the discharge end but is carried around on the hottest side of the chamber.

Work is discharged from each compartment through ports in the circumference of the cylinder; it drops into a two-way spout leading into either a water or oil quenching tank. Encircling these ports, except at the discharge point at the bottom of the furnace, is a fixed tubular ring which serves as a cover for the ports ex-

cept at the discharge point, and also as an air preheating chamber, furnishing air to the burner at 150 to 200 deg. Fahr.

New Type of Heating Radiator

STEEL or copper fins welded on pipe have been made into a new type of heating unit by the Richmond Radiator Co., 1480 Broadway, New York. Known as the Richmond Floorline radiator, the unit is light and easy to handle. It is made $8\frac{1}{2}$ in. high, $3\frac{1}{2}$ in. thick and either 36 or 18 in. long, and occupies little room.

Units may be installed separately or they may be joined end to end or placed one above the other, in providing desired amount of radiation surface in any locality. Because of its low position, this radiator gives heat near the floor. It has been tested for efficiency and rating by the Frost Research Laboratory, Norristown, Pa., and by S. E. Dibble, professor of heating and ventilating, Carnegie Institute of Technology, Pittsburgh. The tests were made on a 30-in. section equivalent to 15 sq. ft. of cast iron radiation, according to the code of the American Society of Heating and Ventilating Engineers.

Specific Savings from Use of Skid Platforms

USE of skid platforms with electric lift trucks has given manufacturers and shippers large savings in time and in labor costs of handling, according to a statement from the Transportation Division of the Department of Commerce. Several instances cited in substantiation of the statement follow:

An automobile manufacturing company formerly unloaded crankshafts from a car by hand, requiring eight men for $7\frac{1}{2}$ hr. at a labor cost of \$24. When skid platforms and lift trucks were substituted for the old method, one driver and one helper could unload a car in 45 min., at a labor cost of 98c.

A railroad in the West reduced the labor payroll in the storekeepers' department over \$15,000 a month by this means. Analysis disclosed a reduction in handling brakeshoes from 175 manual operations to seven; in handling brake beams, from 200 operations to 10.

One concern last year is said to have given to its customers without charge 4000 skids, at a cost of about \$10,000. Its return came from a saving of considerably more than this amount, in stevedore payroll, from the use of the skids by the customers.

Loading a 50-ft. box car with paper by the old method took seven men in a paper company 3 hr. This is now accomplished on skids by two men in 45 min., representing a labor saving of 93 per cent.

August Exports Smallest of Year

Imports Largest in 3 Years—Eight-Month Exports
11 Per Cent Above Last Year, Mostly in
Rolled and Finished Steel

WASHINGTON, Sept. 27.—Making a decrease of 27,676 gross tons, exports of iron and steel products from the United States in August totaled 242,856 tons, against 270,532 tons in July. In August of last year they aggregated 287,297 tons. For the eight months ended with August, they were 2,105,227 tons, an increase of 207,163 tons over the corresponding period of last year, with a total of 1,898,064 tons. The daily average for August was 7834 tons, compared with 8727 tons in July.

August exports were the smallest for any month so far this year, while scrap exports were the largest since August, 1928.

In contrast to outgoing shipments, imports in August, amounting to 83,969 tons, the largest since September, 1926, showed an increase of 12,591

tons over the 71,378 tons imported in July. Imports in August of last year were 76,172 tons. For the eight months of 1929 they were 513,192 tons, a decrease of 10,635 tons from the 523,827 tons imported in the like period of 1928. The daily average of imports in August was 2708 tons, compared with 2302 tons in July.

Scrap formed the largest item of exportation in August, reflecting an increase of 15,839 tons over that shipped abroad in July, but this gain was more than offset by a number of declines. Among the decreases were steel bars, which dropped to 11,936 tons from 17,183 tons; wire rods, decreasing to 2969 tons from 5822 tons; plates, decreasing to 13,924 tons from 19,675 tons and making the lowest total since last September; galvanized sheets, falling to 11,336 tons from 14,-

154 tons; black steel sheets, dropping to 15,890 tons from 18,259 tons; black and galvanized welded pipe, decreasing to 11,497 tons from 14,880 tons; and, the greatest decline of all, plain structural material, only 5278 tons, compared with 29,946 tons. Structural material, plain and fabricated, made the smallest total since September, last year; with that exception, the smallest since February, 1928.

The more important gains, in addition to scrap, were in tin plate, rising to 21,367 tons from 16,875 tons; fabricated material, increasing to 12,647 tons from 10,392 tons; and steel rails, which rose to 12,926 tons from 9999 tons.

Of the steel bars exported in August, 5556 tons went to Canada, 2611 tons to the United Kingdom and 1276 tons to Japan. Canada took 3473 tons

Exports of Iron and Steel from the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1929	1928	1929	1928
Pig iron	2,251	8,404	40,818	42,331
Ferromanganese	204	1,041	1,257	7,039
Scrap	62,857	70,538	359,595	365,601
<i>Pig iron, ferroalloys and scrap</i>	<i>65,312</i>	<i>79,983</i>	<i>401,670</i>	<i>414,971</i>
Ingots, blooms, billets, sheet bar	3,407	5,109	29,694	16,349
Skelp	14,962	11,291	82,733	72,927
Wire rods	2,969	3,620	31,851	25,787
<i>Semi-finished steel</i>	<i>21,338</i>	<i>20,020</i>	<i>144,278</i>	<i>115,063</i>
Steel bars	11,936	12,517	141,739	97,080
Alloy steel bars	449	1,231	12,396	9,825
Iron bars	118	180	3,039	2,494
Plates, iron and steel	13,924	12,199	140,895	98,573
Sheets, galvanized	11,336	13,581	111,910	104,047
Sheets, black steel	15,890	19,069	126,912	128,480
Sheets, black iron	1,664	1,297	10,737	10,140
Hoops, bands, strip steel	4,785	5,121	52,377	37,805
Tin plate;terne plate	21,367	22,374	174,363	169,001
Structural shapes, plain material	5,278	14,333	181,090	118,739
Structural material, fabricated	12,647	6,716	77,710	61,133
Steel rails	12,926	23,999	108,491	144,202
Rail fastenings, switches, frogs, etc.	2,851	2,681	23,000	32,759
Boiler tubes	1,384	1,456	12,690	11,387
Casing and oil-line pipe	9,884	15,164	89,305	79,796
Black and galvanized welded pipe	11,497	13,474	95,161	78,811
Malleable iron screwed pipe fittings	833	854	8,194	6,380
Plain wire	2,994	3,867	32,722	30,803
Barbed wire and woven wire fencing	4,001	5,494	45,384	49,457
Wire cloth and screening	148	235	1,185	1,300
Wire rope	576	509	5,234	3,473
Wire nails	733	905	9,943	10,937
Other nails and tacks	872	754	7,254	6,849
Horseshoes	32	37	252	306
Bolts, nuts, rivets and washers, except track	1,589	1,038	10,948	8,800
<i>Rolled and finished steel</i>	<i>149,714</i>	<i>179,085</i>	<i>1,482,931</i>	<i>1,302,577</i>
Cast iron pipe and fittings	1,735	2,998	22,679	22,848
Car wheels and axles	1,104	1,494	15,216	10,046
Iron castings	442	643	8,422	8,356
Steel castings	868	507	8,133	6,844
Forgings	964	1,318	9,216	7,458
<i>Castings and forgings</i>	<i>5,118</i>	<i>6,960</i>	<i>63,666</i>	<i>55,552</i>
All other	1,379	1,249	12,682	9,901
Total	242,856	287,297	2,105,227	1,898,064

Imports of Iron and Steel into the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1929	1928	1929	1928
Pig iron	12,377	12,990	92,581	94,340
Ferromanganese*	8,496	2,721	46,293	30,017
Ferrocromet	92	94	474	490
Ferrosilicon†	1,124	416	6,340	2,459
Scrap	12,033	5,394	64,407	31,926
<i>Pig iron, ferroalloys and scrap</i>	<i>34,122</i>	<i>21,615</i>	<i>210,095</i>	<i>159,232</i>
Steel ingots, blooms, billets and slabs	2,639	1,338	18,541	14,422
Iron blooms, slabs, etc. ....	.....	.....	.....	4
Wire rods	1,369	1,042	11,207	11,054
<i>Semi-finished steel</i>	<i>4,008</i>	<i>2,380</i>	<i>29,748</i>	<i>25,484</i>
Rails and splice bars	1,517	911	5,644	12,091
Structural shapes	15,695	19,084	103,049	119,118
Boiler and other plates	362	707	2,818	4,062
Sheets and saw plates	3,090	1,566	16,338	17,565
Steel bars	3,778	8,270	25,259	63,608
Bar iron	175	67	2,285	1,453
Hoops, bands and cotton ties	7,225	8,434	28,673	29,929
Tubular products (wrot.)	2,866	4,456	28,114	28,429
Nails, tacks, staples	993	894	6,333	5,757
Tin plate	35	32	208	783
Bolts, nuts, rivets and washers	62	6	227	160
Round iron and steel wire	322	412	4,078	2,852
Barbed wire	727	384	4,269	2,359
Flat wire; strip steel	224	224	1,464	1,563
Steel telegraph and telephone wire	3	15	3	168
Wire rope and strand	175	186	1,686	1,157
Other wire	19	53	385	373
<i>Rolled and finished steel</i>	<i>37,268</i>	<i>45,701</i>	<i>230,833</i>	<i>291,427</i>
Cast iron pipe	8,397	6,288	41,054	45,536
Castings and forgings	174	188	1,462	2,152
Total	83,969	76,172	513,192	523,827
Manganese ore*	32,983	25,996	247,045	131,490
Iron ore	298,013	225,538	2,067,207	1,677,206
Magnesite (dead burned)	7,517	6,981	19,623	38,391

*Manganese content only.

†Chromium content only.

‡Silicon content only.

of plain structural material and 4035 tons of tin plate. Exports of tin plate to Japan were 4734 tons, while 3095 tons went to China. The great bulk of plates was shipped to Canada, that country taking 11,914 tons. It also led in rail shipments, taking 3190 tons; Brazil taking 2565 tons; Chile, 1710 tons; the Philippine Islands, 1475 tons; and Japan, 1372 tons.

Exports to Canada amounted to 35 per cent of the August total, while Japan took 17 per cent. Exports to Canada during the eight months of the current year were 879,228 tons, as against 729,191 tons for the corresponding period of last year, a gain of more than 20 per cent.

The largest item of importation in August was structural shapes, of which 6906 tons came from Germany, 6255 tons from Belgium and 2311 tons from France. Of the hoops, bands and cotton ties imported in August, 5433 tons came from Belgium and 1073 tons came from France. France supplied 6429 tons of the cast iron pipe, and 1945 tons came from Belgium. Sweden furnished 1412 tons of the steel bars imported, and 1351 tons came from Belgium. Canada supplied 11,490 tons of the scrap importations.

Norway was the source of 4378 tons of ferromanganese importations, while 2357 tons came from Canada and 1509

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

	(In Gross Tons)		
	August	July	June
Austria	28	50	34
Azores and Madeira Islands ..	2	.....	.....
Belgium	18,131	15,497	9,888
Bulgaria .....	.....	170	.....
Czechoslovakia ..	95	.....	660
Denmark	1	.....	.....
Finland	1	.....	.....
France	11,423	13,556	9,965
Germany	14,225	13,163	12,580
Italy	367	217	387
Netherlands	908	837	.....
Norway	4,874	1,668	3,677
Poland .....	.....	.....	1,629
Sweden	3,140	3,491	3,835
Switzerland .....	.....	40	3
United Kingdom ..	6,725	4,934	5,790
Europe	59,920	.....	.....
Canada	16,648	13,305	19,942
British Honduras ..	3	.....	.....
Guatemala	2	.....	.....
Mexico	109	32	39
Cuba .....	.....	195	1,200
British India	7,227	5,120	3,963
Japan	30	2	3
Canary Islands ..	30	.....	.....
Total	83,969	71,378	63,635

tons from the United Kingdom. Of the manganese ore imported, 24,843 tons came from Soviet Russia, 5696 tons from Brazil, 1520 tons from India and 884 tons from Chile.

Belgium led as the source of August imports, supplying 18,131 tons; 16,648 tons, an unusually high total, came from Canada; 14,225 tons from Germany and 11,423 tons from France.

Destination of Iron and Steel Exports from the United States

Country of Destination	(In Gross Tons)				
	August, 1929	July, 1929	August, 1928	January Through August	
				1929	1928
North and Central America and West Indies	109,270	113,303	116,659	1,067,324	889,348
Canada and Newfoundland ..	86,937	118,163	95,638	880,714	731,830
Cuba	4,448	5,847	6,029	46,647	43,564
Guatemala	436	949	198	5,212	6,297
Honduras	434	495	326	7,656	4,785
Mexico	10,958	11,906	8,773	68,949	55,569
Panama	1,867	780	1,323	12,868	11,079
Salvador	652	462	209	5,327	2,427
British West Indies	638	697	715	13,720	5,596
Other West Indies	2,159	3,006	2,529	19,549	21,912
Other Central America	741	998	919	6,682	6,289
South America	26,121	28,701	41,492	270,143	300,208
Argentina	5,151	6,421	9,247	65,359	66,993
Brazil	6,160	6,739	8,528	46,415	59,363
Chile	4,396	5,074	9,408	41,311	49,690
Colombia	3,493	2,725	3,143	30,948	45,740
Peru	2,258	3,076	1,223	23,096	15,513
Uruguay	366	381	947	6,188	6,385
Venezuela	3,545	4,024	11,693	52,882	52,832
Other South America	752	261	303	4,034	3,692
Europe	46,330	36,905	43,230	269,887	225,203
Belgium	68	149	1,779	2,017	10,766
France	1,280	3,636	257	14,770	3,196
Germany	119	5,017	24	17,860	20,631
Italy	10,819	10,333	27,208	85,584	79,583
Netherlands	286	226	103	2,026	1,535
Poland and Danzig	13,755	6,634	7,840	68,151	53,645
Rumania	486	479	581	2,770	3,514
Soviet Russia	3,143	131	608	5,386	2,584
United Kingdom	6,657	6,095	3,944	43,973	35,408
Other Europe	3,717	4,295	886	27,350	14,341
Far East	66,033	59,388	81,289	482,938	473,635
British Malaya	2,270	382	937	7,060	4,793
China	4,623	4,749	5,457	50,714	69,715
Netherlands East Indies	3,543	7,452	7,628	47,816	25,369
India and Ceylon	2,381	382	3,794	14,099	18,120
Japan	40,578	31,330	51,482	258,650	266,023
Kwantung	228	617	4,569	8,716	9,048
Philippine Islands	6,974	11,302	5,936	65,327	61,162
Australia	2,502	2,116	1,747	16,065	10,942
New Zealand	18	142	218	2,955	1,429
Other Asia and Far East	2,915	925	521	11,626	7,034
Africa	1,103	2,235	627	11,935	9,670
Union of South Africa	586	1,168	187	5,947	4,000
Egypt	64	585	8	5,844	3,419
Mozambique	332	328	123	1,764	913
Other Africa	121	154	309	1,380	1,338
Total	242,856	270,532	287,297	2,105,227	1,898,064

Chilean Steel Industry to Have Government Support

The project to establish an iron and steel industry in south central Chile appears to be nearer realization with the passing of a law by the national Chilean Congress authorizing the President of the Republic to subscribe on account of the State the greater part of the shares, the total of which will amount to about \$7,260,000, and to assume an active part in the organization and administration of the company, according to a report from Vice-Consul Comden L. McLain, Concepcion, Chile.

The initial project to manufacture iron and steel in the country began in 1905, when the Government granted a French company, the Sociedad Altos Hornos de Corral, a concession to exploit a large timbered tract in the vicinity of Valdivia and to construct a blast furnace at Corral. This plant was partially completed in 1910 at a cost of 14,700,000 pesos (\$3,381,000), and in 1911 some 4000 tons of iron was manufactured.

Since that time the furnace has been closed, due principally, it is stated, to the impracticability of the Prud'homme system of ore reduction as applied at Corral. Subsequently the iron ore supply of the company in northern Chile was sold and in 1924 a group of industrialists at Valdivia organized a company under the name of Compania Electro-Siderurgica y Industrial de Valdivia and purchased the remaining property of the Sociedad Altos Hornos de Corral. The Government again offered generous aid (under Law 4110 of Dec. 28, 1926), but the problems surrounding the establishment of the industry on a sound basis appeared to be too great.

Former Munitions Plant to Make Track Material

HAMBURG, GERMANY, Sept. 16.—The former Government munition works at Spandau will start production of open-hearth bolts, rivets, spikes and other track material soon after Oct. 1. The plant will have an annual capacity of 150,000 tons and will be one of the most modern steel plants in Europe. Labor-saving devices have been installed throughout. In the bar mill, where output will be handled by a minimum of men, production per capita is expected to be the largest for any mill in Germany. The principal raw material used will be steel scrap shipped to Spandau from the Berlin district.

The Rohrbachwerke A. G., German builder of flying boats, has organized the Metal Flying Boat Corporation, with headquarters in New York. The American company will shortly start the production of metal flying boats similar to those in service in Germany, which have a maximum capacity of 45 passengers.

Institute of Metals Visits Düsseldorf

British Foundrymen Inspect Iron and Steel Plants in the Ruhr—
Germans Hold Foundry Exposition

(Special Correspondence)

DÜSSELDORF, GERMANY, Sept. 15.—Nearly 300 members of the Institute of Metals attended the annual autumn meeting at this place, and while most were from Great Britain, a considerable number came from other countries. The Association of German Iron Foundries and the Society of German Iron Foundrymen were also in convention, and at their invitation many of the visitors inspected the educational and foundry trade exhibition.

The Düsseldorf meeting was the first that a British engineering or metallurgical body had held in Germany since the war and it was one of the most successful international gatherings of recent years. In view of the importance of Germany as a competitor of Great Britain in the world's markets, it had a special significance, but the whole proceedings were conducted in an even more than friendly manner and the arrangements could not have been better.

The feature of the exhibition that impressed one most was that the scientific, or what may be termed the metallurgical side of foundry practice, was more in prominence than the plant or equipment side. The display of micro-photographic equipment, pyrometric instruments and laboratory equipment was in advance of either of the Paris exhibitions or the several British exhibitions that have been held in recent years. It may be admitted that the exposition was not of as great interest to practical foundrymen, because it is doubtful if the machinery and furnace sections were as good. A number of molding machines were on view of orthodox designs, including several American machines, in operation that were made under license by German firms. Handling and conveying plant were not much in evidence, although there was a model of the mold conveyor used at the Citroen foundries in France. It was also rather disappointing that the model foundry in the exhibition hall was not laid out on more modern lines for repetition castings.

Copper Castings Deoxidized with Beryllium

Oil-sand cores have become very popular in Germany, but the most interesting exhibit was comprised of a number of copper castings, homogeneous and sound in every way. As is well known, it has until recently been almost impossible to obtain castings of pure copper, but this has now become possible by the addition of a small percentage of beryllium, which acts as a deoxidizer.

Electric furnaces are not used to a considerable extent as melting units in European foundries even yet, but there were a number of high-frequency and induction furnaces on view. One of the most interesting exhibits in the hall was a cupola tapping device made by Werner Handelsgesellschaft, Düsseldorf. By means of a simple arrangement of levers and weights a conical plug is directed into

the tapping hole; when iron is required the furnaceman pulls a lever and this withdraws the plug, and when the ladle has been filled he simply releases the handle and the plug swings back into place. This device should be useful in jobbing foundries and is a most simple and practical method of controlling the flow of metal.

Several works were visited by the members, including those of J. G. Schwietzke and August Thyssen. Schwietzke are non-ferrous foundries; their equipment includes shaft furnaces with crucibles up to 1300 lb. capacity and oil-fired and gas-fired furnaces. The firm claims to be one of the largest and best equipped non-ferrous foundries in Germany, comparable with large foundries in ship-building centers in England, and is well organized for production and has a very well equipped laboratory.

Steel and Iron Plants Visited

At the August Thyssen works a feature is a special type of blast furnace with an elaborately constructed charging gear. Steel castings are the specialty, but while many castings were examined closely by the visitors at both these works and, later, at the Krupp works at Essen, they seemed to be as good but no better than those obtained in British steel foundries.

Doctor Lehr, Lord Mayor of Düsseldorf, impressed his guests with the growing importance of Düsseldorf as an industrial center. The most important industry is the manufacture of iron, steel and other metals in all forms, while the heavy industries are chiefly concerned with the manufacture of semi-finished iron and steel, rolled sheets and wire, tubes, cast and forged machine parts of all sizes, bridges and iron work.

Few Electric Furnaces in Continental Foundries

One of the most interesting papers read was on "Progress in Electric Furnaces for Non-Ferrous Metals," by a German member of the institute, M.

Tama. An American visitor contributed some interesting remarks to the discussion on this subject in regard to the use in the United States of the electric furnace for annealing purposes and also for electric carbonizing. The question of heat treating aluminum castings and forgings was also discussed, and the statement was made that in the Birmingham area, which is the largest non-ferrous district in Great Britain, electric melting had increased in recent years.

Krupp Plant Roomy and Clean

On the last day of the conference the members visited the Krupp works at Essen. At the present time the Krupp firm employs altogether about 70,000 people, 30,000 of whom are at Essen. It is a remarkable achievement that, apart from the shipyard at Kiel, the Krupp company's manufactures have been almost entirely changed since the war. All kinds of machinery, including agricultural, are made by the firm. The blast furnace plant is up-to-date, comprising 10 blast furnaces and two special furnaces for various classes of high grade ferromanganese and ferrochromium. The coke oven plant at the works, comprising 175 ovens, produces approximately 1700 tons of blast furnace coke per day, but much additional coke is required. There is an up-to-date by-product plant at Essen and most of the pig iron produced by the blast furnaces is utilized in the steel works after it has passed through two 900-ton mixers. Essen possesses 14 rolling mills, viz. three heavy blooming mills, four roughing, three intermediate and three finishing mills, together with a wire mill. Additions have recently been made to the blast furnace plant and hydraulic press plant. In the steel foundries castings are made from the smallest to the largest sizes. A feature of the whole works is the excellent lighting and ventilation.

It is but fair to say that while Krupps have shown great enterprise in turning their attention to peace manufactures, their general works practice appears to be in no way exceptional. In the laboratories, testing methods do not seem to be ahead of those in general use in England and America; in some cases the analytical methods are distinctly older than those used by many steel and iron firms. The firm was particularly hospitable to the visitors and afforded them every conceivable facility for obtaining information of an exact kind about the organization, methods and equipment of the works.

Meeting of Drop Forging Association

Costs, Market Research and Broad Future Developments Among Topics of Last Week's Convention

THE American Drop Forging Institute held a meeting at the Buckwood Inn, Shawnee-on-Delaware, Pa., Sept. 25, 26 and 27. It listened to a number of scheduled addresses on Wednesday and Thursday mornings, devoted itself to a discussion of costs and cost finding under the direction of R. T. Herdegen on Friday morning, played golf in the afternoons and banqueted Thursday evening, with L. W. Greve, one of the directors, presiding as toastmaster. Charles H. Smith, Steel Improvement & Forge Co., Cleveland, secretary-treasurer of the association, was executive officer of the convention.

President A. C. Johnson, secretary, Rockford Drop Forge Co., reported on the progress of the association. Two of the technical papers had to do (1) with the inclosed fan-cooled motor for the forge shop, presented by A. M. McCutcheon, Reliance Electric Co., Cleveland, and (2) with steam generation and steam consumption, presented by Harold F. Wood, Wyman & Gordon Co., Harvey, Ill. Dr. Zay Jeffries, United States Aluminum Co., gave an inspirational and informative address, outlining what is going on in the scientific world and what is shaping up by way of applications that are likely to have far-reaching effects on social as well as industrial progress.

Charles F. Abbott, executive director of the American Institute of Steel Construction, New York, under the title of "Rationalizing Output," made one of the principal addresses, which in part covered the following:

Value of Market Research

The principal problem confronting most industries at the present time is that of the market. In most cases the application of research by an organized industry would develop new practical uses for a product and at the same time locate new opportunities for extending present markets. Steel plate floor construction, the use of steel in dams, in airports and hangars and in residences, all represent the result of concerted research to locate and develop new uses for the structural steel industry.

When we suggest research for an industry we should not expect immediate results. It is no assured talisman, for results will depend upon how research is conducted. In order that it may be productive of good for the industry as a whole, it must be carried on by the industry and not left to a single company. In that case the industry will profit through impartial investigation while, when in the hands of a single corporation, the benefits must of necessity be selfishly applied and selfishly circumscribed.

It is too bad that some money-mak-

ing and money-saving methods are called "research." The word calls up visions of high-brow investigations by expensive experts. "Research" has a scientific sound. An ordinary business man is scared by it; in fact, he may think trade research is theoretical and academic. He turns impatiently from it to his rule of thumb practices—which sometimes lead him to bankruptcy.

Research improperly applied may prove an industrial waste. Dr. Julius Klein, assistant secretary of commerce, holds that between eight and

ten billion dollars annually is chargeable to waste in the conduct of business in America. This waste about equaled the value of all our foreign trade in 1928. Waste occurs through excessive expenditures in sales promotion, unwise credit methods, disorderly marketing, extravagant delivery services, ill-judged advertising, etc.

Research may be just as successful in the market place as in the laboratory. Often the opportunities of research are lying beneath our noses unnoticed, and that is what makes business opportunities so plentiful, and why it is always unwise to depreciate the efforts of even the smallest competitor. In cooperative effort we profit by bearing each other's burdens as well as in sharing each other's benefits.

Steel Merger Plan Approved

Hanna, Weirton, Great Lakes Holding Company Ratified— To Be Called National Steel Corporation

THE Hanna-Weirton-Great Lakes Steel merger became effective Oct. 1, following the approval of the terms of agreement by stockholders of affiliating companies, the Weirton Steel Co., Weirton, W. Va., Great Lakes Steel Corporation, Detroit, and the M. A. Hanna Co., Cleveland. The merged properties include the steel plants of the Weirton and Great Lakes companies and the blast furnaces, ore mines and vessel interests of the Hanna company.

The holding company that will control the merged properties will be known as the National Steel Corporation. This will be a Delaware corporation and will have an authorized capitalization of 3,000,000 shares of no par common stock, of which 2,080,000 will be issued at present and distributed to stockholders of the merged companies on the following basis:

Weirton stockholders will receive 1,120,000 shares or 4.7 shares of the holding company in exchange for each share of \$100 par value Weirton stock. Hanna stockholders will receive 560,000 shares in exchange for shares of stock of the Hanna subsidiaries. Great Lakes stockholders will receive 400,000 shares in even exchange for each full paid share of that corporation's no par common stock. In addition they will receive warrants entitling the holder to purchase an additional one-fifth share on or before Dec. 31, 1929, at \$62.50 a share and warrants for the purchase of an additional one-fifth share on or before Oct. 1, 1934, at the same price.

George R. Fink, president of the Great Lakes Steel Corporation, who under an organization agreement with that corporation was given the right to subscribe within five years to 20,000 shares of common stock of Great Lakes at \$50 per share, is given the right to purchase an equal amount of

stock of the new corporation at \$50 a share on or before Oct. 1, 1934.

Management of the holding company will be under the direction of E. T. Weir, president, Weirton Steel Co., as chairman of the board, George M. Humphrey, president of the M. A. Hanna Co., as president of the executive committee, and Mr. Fink, who will be president of the holding company. These three executives comprise a committee that is authorized to determine the form of articles of incorporation of the new company and to draw up by-laws and carry out other details that may be required to place the merger in effect.

Simplified Practice on Several Products

Elimination of waste through simplified commercial practice has been carried by the United States Department of Commerce into welded chain, sheet steel and grinding wheels, which form the subjects of recent practice recommendations issued by that department. The welded chain specifications are carried in recommendation R100-29, which lists the sizes and types of chains eliminated in making up the simplified list. The recommendation is subject to annual revision by those interested.

Sheet steel, covered in recommendation R28-29, shows in tabular form the sizes of sheets of various gages adopted by the simplification conference. These include galvanized flat sheets, one-pass cold-rolled box annealed sheets and blue annealed sheets. Grinding wheels are covered in recommendation R45-28. The types which have been adopted as standard are illustrated and are covered in tabular matter giving standard dimensions and other particulars.

To Trace Migration of Industry

Idle Power Equipment Also to Be Studied in Census of Manufactures for 1929

WASHINGTON, Oct. 1.—The census of manufactures for 1929 will include data showing the trends of industrial migration and the idle power equipment of the United States. This will be the first time such information has been gathered. It is also the purpose to tabulate the schedules, which will go out next January to every manufacturer in the country, as speedily as possible. Plans for the census have been made public, following the report to Secretary of Commerce R. P. Lamont of the Advisory Committee on Manufactures under the chairmanship of Col. L. S. Horner, president, Niles-Bement-Pond Co.

This report stated that the basic thought in mind is that the information will be of real practical value, directly or indirectly, to manufacturers in their studies of production and distribution problems. Data which do not fall under this general heading have been eliminated, and new material of large practical value will be requested for the first time from manufacturers of the country.

Movements of Industrial Plants

It is the underlying purpose to tabulate data furnished by manufacturers in such a way as to point out the most significant industrial trends. Among these trends is that of migration of industry. Large movements of industry have been under way, especially since the World War, the advisory committee reported.

Some of these movements have involved the transfer of thousands of employees from one section of the country to the other, and have entirely changed the industrial occupation of a large portion of the inhabitants of these sections. The textile industry was pointed to as being an outstanding example of such migration. In other cases, it was stated, there has been a distinct drift by manufacturers away from urban communities into the smaller towns.

Again, a tendency toward concentration of certain industries has been prevalent, while other industries have tended to spread throughout the country. All of these trends have been recognized by the committee as having a large influence on the employment phase of industry. It has been generally known that such trends are under way, but definite data are not available.

Much Power Equipment Is Idle

The amount of idle power equipment in the manufacturing plants of the country will be ascertained for the first time. Estimates have been made that as much as 50 per cent of the installed power practically is idle through obsolescence, over-capacity or other causes. Specific information, however, on this significant subject has never been made available

from any source. Power installation was referred to in the report as one of the best possible bases for industrial market studies. But the inaccuracy of available data due to the inclusion of this large amount of idle power equipment has deprived such studies of much of their potential value.

The Census Bureau is making special efforts to get the statistics on manufacturing operations back to the manufacturers at as early a date as possible. Realizing that an early report from manufacturers is dependent largely on the interest they manifest in making early returns, the advisory committee has appointed a publicity committee composed of Robert M. Davis, McGraw-Hill Publishing Co., chairman; Dr. H. P. Baker,

Chamber of Commerce of the United States, and Dr. Roland P. Falkner, National Industrial Conference Board. This committee will bring the census of manufacturers to the attention of manufacturing executives in a positive way in the next few months through radio and press and by addresses before trade organizations.

Members of the publicity committee are also members of the advisory committee. Among additional members of the latter committee are Charles F. Abbott, American Institute of Steel Construction, New York; George G. Crawford, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; Walter S. Tower, Bethlehem Steel Co., Bethlehem, Pa.; Clarence M. Woolley, American Radiator Co., New York; J. E. Edgerton, National Association of Manufacturers; Virgil Jordan, late of the National Industrial Conference Board, and now with *Business Week*, New York, and F. M. Feiker, Associated Business Papers, Inc., New York.

New Bolt and Nut Plant on Pacific Coast

PACIFIC COAST STEEL CO. has added a plant at its South San Francisco, Cal., works for the manufacture of bolts, nuts, rivets, cap screws, track spikes and kindred products. Capacity is 1200 tons a month.

Equipment includes two continuous and four hand-fed National hot bolt machines; three National hot nut machines; three cold press nut machines and two cold trimming machines, built by the Waterbury-Farrel Foundry & Machine Co.; 15 automatic Economy Engineering Co. threaders; three Landis Machine Co. automatic threaders; four Landis and two Holmes hand threaders; two Waterbury-Farrel hand roll threaders; three National burring machines; five National pointers; one National flash trimmer; two National spindle tappers, 15 National automatic cappers.

Bolt rod used is high tensile steel manufactured by the company. Heat treating facilities with automatic temperature control are provided. For heat treating the cold-headed product a Westinghouse electric rotary-hearth normalizing and heat treating furnace has been installed.

All machines are individually motor driven and every motor is remote controlled.

The new plant is a one-story steel frame structure, 180 x 540 ft., composed of two bays, each 90 ft. wide, and is sheathed and roofed with corrugated sheet steel. About 60 per cent of the wall area is glass, insuring natural illumination throughout the building. Each bay, throughout its length, is served by a 10-ton electric traveling crane. The building, exclusive of equipment, cost \$120,000.



British and German Metallurgists Meet

Keynote of Düsseldorf Meeting Is Improvements in Production of Light Metals

DÜSSELDORF, GERMANY, Sept. 15.—The joint meetings of the British Institute of Metals and the Deutsche Gesellschaft für Metallkunde were held here from Sept. 7 to 13, at the invitation of the German institute. Papers were presented by members of the German organization during the first half of the week and by members of the British Institute of Metals in the latter part of the week. Certain of the German metallurgists read their papers in English, but the principal papers, which were presented by Dr. A. G. C. Gwyer and by Dr. W. Rosenhain, president, British Institute of Metals, were in German.

A total of 39 papers were read during the seven days of the meeting, of which 18 were submitted by members of the Deutsche Gesellschaft für Metallkunde. During the convention members of the two institutes visited the Kaiser Wilhelm Institute for Steel Research, attended the foundry exhibition and visited the J. G. Schwiertzke Metal Works, Demag A. G. of Benrath, Duisburger Kupferhütte and the works of the Friedrich Krupp A. G. at Essen, where they inspected the departments producing Nirosta steel and Widia metal. Members of the British institute were guests of the German association at a dinner on the Rheinterrassen in Düsseldorf, and there were excursions on the Rhine.

Improved Light-Metal Alloys

The keynote of the papers presented was improvement in the production of light-metal alloys. Doctor Rosenhain, president of the British Institute of Metals, discussed the importance of absolutely pure metals for the physicist and explained that pure zinc, iron, manganese and chromium have shown surprising results in tests of their physical properties, especially after heat treating. Absolutely pure metals show considerable resistance to oxidation and corrosion and offer the physicist such a wide field of research that the metal industry should begin to consider their production as of great importance. Doctor Rosenhain pointed out particularly that metal research is now devoting more attention to the interior structure of metals, studied by the X-ray. The physical properties of metals, he said, are not only dependent upon the alloy itself, but even more on the form of the interior structure, and there is the possibility of influencing the structure of the crystals through special methods of treating.

Aluminum Alloy Treatment

Dr. A. G. C. Gwyer, prominent in England for his research in the field of aluminum alloys, predicted that the present knowledge of aluminum alloys will be greatly altered through current investigations of their reactions under heat treatment. In the past,

effort has been directed toward obtaining certain physical properties in aluminum alloys by changing the composition of the alloy, with additions of copper, zinc, lead, lithium or manganese. Special methods of heat treatment, however, promise far better results, especially with X-ray spectrography.

Considerable interest was shown in a paper on magnesium-zinc-aluminum alloys, presented by Dr. G. Wassermann of Berlin. He said that the possibilities of such alloys have been carefully investigated for the first time and it has been found that magnesium promises to give especially good results where unusually high tensile strength and favorable elongation, not as yet found in other light-metal alloys, is required.

Aluminum Cable Used in Europe

As invited guests, Dr. A. Von Zeerleder and P. Bourgeois of Neuhausen, Switzerland, submitted a paper discussing the influence of temperature on cables in the open air. The paper largely dealt with the recently developed aluminum alloy "Aldrey," which is beginning to be used extensively in replacement of copper wire for cables in Continental countries. Its electrical conductivity is only 14 per cent less than that of copper. It is lower in cost and, of considerable importance, is but little influenced in its conductivity by current transmission or the heat of the sun. Copper cables, the paper pointed out, are affected both by the current and the sun's heat. As a result, it is possible to use a much higher electric tension with the aluminum alloy than with copper. It was noted that Swiss, German, Austrian, Italian and other telegraph companies are now installing the aluminum alloy cables.

Beryllium as Aluminum Alloy

A paper by Dr. I. N. Friend of Birmingham, England, called attention to recent advances in preventing corrosion in non-ferrous metals, and said that it appears certain that it will be easier to solve the problem of corrosion in non-ferrous metal products than in steel. He suggested that it will be possible in the future to produce corrosion-resisting non-ferrous metals with the physical properties of steel at lower costs than steel alloys. The future use of beryllium lies not so much in steel as in aluminum, according to Dr. Ing. Denzo Uno of Aachen. Experiments, he said, have shown that beryllium-aluminum alloys, when properly treated, lend themselves to wide use in the electrical industry, especially for the production of electric lamps.

The bending properties of galvanized steel products depend entirely upon the thickness of the zinc coating, said Dr. Heinz Bablik of Vienna. The

lighter the coating the better the bending properties. Zinc should merely cover the steel, he said, and the area where zinc is fused with steel should be as thin as possible. To accomplish this, electrolytic zinc is most suitable, he declared. This was confirmed in the discussion which followed.

Other papers read included "Heat Treatment of Copper-Zinc Alloys," by M. Hansen; "Elongation of Aluminum," by Chevenard; "Crystallization of Iron and Copper Alloys," by Brenthel. During the meetings the British Institute of Metals elected Professor Thammann of Göttingen an honorary member.

"Pittsburgh's Preeminence in Steel Will Endure"

—C. M. Schwab

That Pittsburgh's preeminence in the world's iron and steel industry will endure for at least another century was the prediction of Charles M. Schwab, chairman of the Bethlehem Steel Corporation, in a talk on Sept. 26 at a house-warming of the Chamber of Commerce of Pittsburgh in its remodeled and enlarged quarters.

"Prophecy is a dangerous thing," said Mr. Schwab, "but I feel that Pittsburgh is going to be the greatest center for iron and steel for all time. I see no reason now for any prediction other than continued prosperity over the country with constantly good business for Pittsburgh, the city where I made my start in the steel industry just 50 years ago."

Speaking before an audience of Pittsburgh business men, many of whom he had known in the steel industry before the turn of the century, Mr. Schwab pointed out that Pittsburgh, because of its steel-making traditions and because the making of steel is in the blood of the people, need have nothing to fear from competitive centers. He traced the history of steel-making in the United States and pointed out that he had been ridiculed a few years ago for predicting that steel production in this country would reach 50,000,000 tons annually. Now, he pointed out, this figure is being exceeded by 4,000,000 or 5,000,000 tons.

Among those on the committee to welcome Mr. Schwab to Pittsburgh were Willis L. King, vice-president, Jones & Laughlin Steel Corporation; George M. Laughlin and T. M. Girdler, respectively chairman and president of that company, and J. M. Lind, president, Carlem Engineering Co. Mr. Girdler was toastmaster at the dinner.

An annual vacation of one week with full pay granted all factory employees by the Mathews Conveyor Co., Ellwood City, Pa., has proved beneficial, according to F. E. Moore, president, who states that each man seems happier and is showing more efficient workmanship as a result of the plan, which became effective during the past summer.

Charles M. Schwab Honored for Service

Directors of American Iron and Steel Institute Present Him with Clock as He Enters Fiftieth Year in Industry

DIRECTORS of the American Iron and Steel Institute, meeting at the Metropolitan Club, New York, Sept. 20, presented a gold folding desk clock to Charles M. Schwab, in commemoration of his entry into the fiftieth year of service in the iron and steel industry. The clock, which is a minute repeater with a radium dial, bears the initials, C. M. S., on the back and the following inscription on the base:

Charles M. Schwab
from
The Directors
of the
American Iron and Steel Institute
To Commemorate
Fifty Years of Constructive Service
in the
Iron and Steel Industry

James A. Farrell, president, United States Steel Corporation, made the presentation address, which follows:

Mr. Schwab, in behalf of your colleagues and fellow members of the directorate of the American Iron and Steel Institute on this occasion, we wish to offer our congratulations and best wishes to you upon your entry into the fiftieth year of your active association and leadership in the American iron and steel industry.

Your prominence in the steel industry has been universally accorded to you. You have risen to it solely through natural ability and application. You have had the distinction of being awarded the Bessemer Medal and many other honors of note.

This moment moves me to happy memories. Because of your genial nature and our many years of intimate friendship, we beg your indulgence for the unalloyed words of appreciation and praise which we now bestow upon you.

Back of every worthwhile deed of any man is the propulsive power of heart interest, something of which we think much, but seldom talk over with friends who have the same conviction. Nothing can endure unless it touches the sources of genuine heart sincerity, for "as we are sincere, so are we perfect," said one of the greatest of ancient philosophers.

In this moment of retrospection of the incidents and associations with Charles M. Schwab, which reach to the very depths of our hearts, it is difficult to find words adequate for expression. To be actively identified with a major industry of this country for 50 years is indeed an inspiring and outstanding chapter in the annals of human existence and endeavor.

Since the eventful day of Sept. 12, 1880, when you first applied for a job in the steel mills at Braddock in your home State, I have, with others, as a co-worker and colleague, had the good fortune to follow your advance-

ment and your unceasing devotion and labor for the upbuilding of the steel industry of the United States.

Your march of progress to world recognition has been replete with action and history that will probably



CHARLES M. SCHWAB

never come to any other man. Your optimism has added color to many a drab day of life for those who know you best, and has been the incentive for others to work to the goals of success and to find happiness and contentment in their chosen vocations. Your influence has, like bands of steel, gripped the heart and soul of many young men also fired with an ambition to succeed in business. Many of your early and present co-workers will gladly testify that you put romance in work and magic in their everyday existence.

In the phase of management, you have contributed the factor of sentiment and the desire to consider the welfare of the worker and the entire industry as an art. You have tried to understand all people, large or small, progressive or conservative. In your work, you have not belonged to any particular locality, although we are well aware of your attachment to the Keystone State and its western hills and valleys.

In your vigorous career, you have seen not only our basic industry develop from an infant to one of important magnitude, but have seen others born and perfected, the possibilities of which we hardly dreamed of in the old "puddling" days.

You have also experienced, at first hand, the distress of modern warfare. With a keen sense of public obligation and putting other ambitions aside in order to serve your country, you played a mighty rôle in supplying the necessities of war. With our nation drawn into this conflict you, through force and personality, pointed the way of work and loyalty to a multi-

tude of men in the shipbuilding industry, which has forever stamped you as an outstanding leader and a citizen whose usefulness can be measured only in terms of unbounded appreciation.

Your contribution of untiring energy and scholarship to the American Iron and Steel Institute is too well known throughout our land for me to comment upon it. Under your presidency it will continue to grow in quantity and quality, and we hope that you will be spared for many years to come to sound semi-annually to its members the keynote of our manufacturing progress and principles.

We fully realize that the greatest compensation which can come to you is the knowledge and assurance that you have the good-will of every member of this institute and your fellow directors. Our appreciation of your administration is unbounded, because of what it means to the progress of this country and the affairs of the world.

As our honored friend and member today, it is the desire of the directors of the American Iron and Steel Institute to have you carry away some visible evidence to commemorate your half century of service to the steel industry.

Acting in their behalf, it is, therefore, a happy privilege to present to you this clock, symbolic of the time and years you have labored with us, and the friendships that have survived the passing of time. May the memory of these friendships be a source of never ending satisfaction to you.

Technical Papers for Steel Institute's Fall Meeting

The thirty-sixth general meeting of the American Iron and Steel Institute will be held at the Commodore Hotel, New York, Friday, Oct. 25. There will be the usual technical sessions morning and afternoon, followed by a banquet in the evening. The technical program follows:

"Fatigue of Metals," by Prof. H. F. Moore, research professor of engineering materials, University of Illinois, Urbana, Ill.

"Thermit Welding and the Steel Mill," by J. H. Deppeler, chief engineer, Metal & Thermit Corporation, New York.

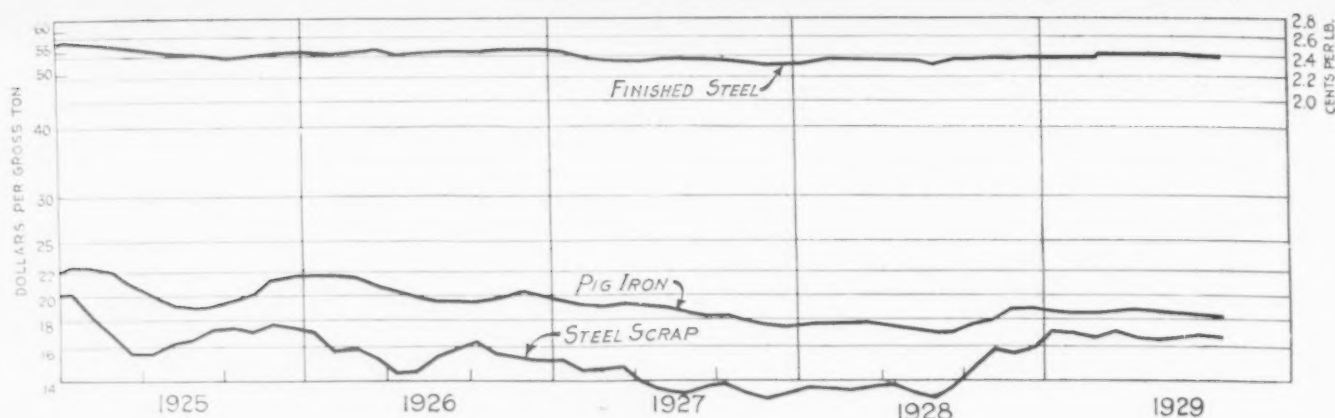
"Waste Prevention and Salvage as Applied to the Steel Industry," by Frank Parrish, supervisor of inventories, United States Steel Corporation, New York.

"Steel's Growing Service to Civilization," by E. F. Kenney, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa.

"A Study of Basic Open-Hearth Slag by Solidification Tests," by E. J. Janitzky, metallurgist, South Works, Illinois Steel Co., South Chicago, Ill.

Latrobe Electric Steel Co. has moved its Cleveland office and warehouse from 1280 Ontario Street to larger quarters at 5140 Superior Avenue.

Scrap Prices Have Held Closely to Those for Pig Iron for Nearly a Year. By contrast, finished steel has had a narrow range over the past several years



Scrap Prices Have Moved Lower

Third-Quarter Average Is Lowest of Year—Spread Still Small Between Scrap and Pig Iron

AFTER a bulge in mid-August, prices of heavy melting steel scrap, averaged for Chicago, Pittsburgh and Philadelphia, have gone considerably lower, last week's level having been \$16.33, against \$16.92 prevailing through most of August. The latest average is exactly the same as that at the end of June and at the end of May, which is the lowest point that has been reached so far this year.

The trend of the year has been generally downward, maximum prices having been recorded at the end of January. The present level is \$1.25 lower than eight months ago.

For the third quarter the average stands at \$16.69, compared with \$16.70 for the second quarter and \$16.90 for the first quarter of the year. All three quarters this year have been at higher levels than have prevailed since 1925.

Meanwhile, the average price for pig iron has been lower, the general trend being downward since the second quarter. For the third quarter an

average of \$18.38 has been made, comparing with \$18.62 for the second quarter and \$18.39 for the first quarter.

Finished steel has taken a downward turn since early August, but the range since the middle of 1925 has been slight. For the third quarter the average is 2.403c. a lb., comparing with 2.412c. prevailing throughout the second quarter and 2.391c. throughout the first quarter. The current figures are not the lowest of recent years, as 2.318c. was registered in January, 1928.

A spread of \$1.67 between scrap and pig iron in September may be compared with only \$1.42 in January and February and with over \$4 as recently as March, 1928.

Comparative figures for the past 21 months covering steel scrap, pig iron and finished steel are given in the table. The diagram carries the story of these changing prices over a period of nearly five years.

COMPOSITE PRICES

	(Gross Ton) Steel Scrap	Pig Iron	Finished Steel, Lb.
1925 average...	\$17.12	\$20.58	2.465c.
1926 average...	15.48	20.42	2.439c.
1927 average...	14.00	18.55	2.357c.
January, 1928...	13.70	17.63	2.318c.
February	13.71	17.73	2.361c.
March	13.65	17.73	2.362c.
April	13.81	17.67	2.359c.
May	13.90	17.45	2.350c.
June	13.52	17.23	2.341c.
July	13.13	17.10	2.325c.
August	13.75	17.11	2.348c.
September	14.75	17.54	2.348c.
October	15.85	17.94	2.363c.
November	15.73	18.46	2.368c.
December	15.97	18.51	2.385c.
Year's average...	14.29	17.67	2.352c.
January, 1929...	17.02	18.43	2.391c.
February	16.96	18.38	2.391c.
March	16.71	18.36	2.391c.
April	17.18	18.52	2.412c.
May	16.54	18.70	2.412c.
June	16.39	18.65	2.412c.
Half year.....	16.80	18.51	2.402c.
July	16.60	18.48	2.412c.
August	16.86	18.38	2.402c.
September	16.60	18.27	2.394c.
Third quarter..	16.69	18.38	2.403c.

Largest Nitriding Furnace Is Now Operating

The Central Alloy Steel Corporation has completed construction and started operation of the largest nitriding furnace in the world at its Canton, Ohio, works, according to an announcement by F. J. Griffiths, chairman of the company. The new furnace will be utilized to promote the use of Nitalloy, one of the new alloys being produced by the company under Krupp licenses. Demand has doubled in the last few months and the corporation is now on a regular production schedule for Nitalloy.

The nitriding process is applied after the metal has been fabricated into the finished part, and the company has placed the facilities of the new nitriding furnace at the disposal of manufacturers who, at present, lack such equipment. This is enabling them to make tests with Nitalloy be-

fore installing their own equipment for nitriding, which is a relatively simple process. The size of the furnace permits the company to nitride parts up to 23 ft. long, including such large pieces as cross-head guides for locomotives.

Mystic Iron Works Objects to Proposed Iron Rates

WASHINGTON, Oct. 1.—The proposed level of rates on pig iron from the furnace of the Mystic Iron Works, Everett, Mass., contained in the recent report of Examiner C. E. Simmons of the Interstate Commerce Commission, is objected to in a statement filed with the commission by counsel for the Mystic furnace.

It is contended in the statement that the proposed scale is too high and that it fixes rates for 30 miles and under that are higher than the present rates. In course of other exceptions it is stated as self-evident that the average interstate haul in New England is appreciably less than the average interstate haul in any other pig iron producing district. It is declared that the New England local rate structure on pig iron should correspond with the local rate structure on the same commodity in the other parts of the official territory for like hauls.

German Lathe Makers Unite

HAMBURG, GERMANY, Sept. 16.—Leading builders of lathes in Germany have formed a corporation, which will schedule output for the various manufacturers of turret, engine and other lathes, in an effort to prevent duplication of production. It is planned to confine each subsidiary company to one class of tool in an effort to reduce production costs. Sales will be controlled by the corporation both in Germany and abroad.

The International Acetylene Association will hold its annual meeting at the Congress Hotel, Chicago, Nov. 13 to 15. A. Cressy Morrison, 30 East Forty-second Street, New York, is secretary.

This Issue in Brief

Six-day "emergency stock" guards against production tie-up in the event of a material shortage. If reserve supply must be drawn upon for current production needs, a shortage report is immediately sent to the production department. When fresh material is received, reserve supply is immediately replenished.—Page 891.

* * *

Heat-treating furnace has ten hearths and one heating chamber. The furnace is of the rotary type, with the hearth extending down the center. Work is carried through a revolving barrel and is brought to temperature by radiant heat.—Page 908.

* * *

Accidents can be cut 50 per cent when foremen's cooperation is fully enlisted. Analyses of accidents show that, even in the well-ordered and well-guarded shop, most accidents are due to carelessness on part of the workmen or laxity in general shop instructions and practices.—Page 896.

* * *

Welding of stainless steels can be done successfully if nickel-chromium alloys are used. The serious grain growth, which develops in the straight chromium-iron alloys, is absent.—Page 888

* * *

Condemns wearing of gloves around machine tools. Added accident hazard more than offsets any advantage gained, says manufacturing executive.—Page 896.

* * *

Iron and steel imports highest in three years. August total was 83,969 tons, largest since September, 1926. Exports were 242,856 tons, lowest this year.—Page 909.

Forging of chrome-nickel alloys can be done without difficulty between 2200 deg. and 1700 deg. Fahr. Below this range the metal has a tendency to rupture, if not crack.—Page 890.

* * *

Successful business today demands "creative spending" rather than "pinching economy," says association head. "Instead of the hang-on-to-the-dollar type there is needed the spend-plenty-of-money - promptly - on - competent-analysis type."—Page 901.

* * *

Pure copper castings, sound in every way, made by adding a small percentage of beryllium. The "almost impossible" is made possible by using the rare metal as a deoxidizer.—Page 911.

* * *

Cuts machining and assembling time from three weeks to three days. Pump casing which formerly consisted of 28 separate parts, requiring 44 machining operations, is now cast in two halves, which are machined in one set-up.—Page 897.

* * *

Production superintendent gives typed instructions simultaneously to 18 foremen by means of electric typewriters. New system speeds operations, does away with need for messengers, and reduces probability of error.—Page 893.

* * *

New September pig iron production record established with average daily output of 115,553 tons, which was 4.6 per cent below August daily rate. On Oct. 1 there were 205 furnaces in blast, a net loss of 5 for the month.—Page 922.

Machining costs cut by mounting 86 cutters on 7-ft. boring bar, weighing more than a ton. Cutters are set by micrometer gages, and each can be removed and ground without disturbing the others.—Page 897.

* * *

Non-rusting metal of the future will be non-ferrous, metallurgist believes. It appears certain, he says, that it will be easier to solve the problem of corrosion in non-ferrous metal products than in steel, and that the non-ferrous metals will be made at lower costs.—Page 914.

* * *

Will embrittlement develop in chromium-nickel alloys under certain atmospheric conditions? Stainless steel specialist fears so, although it may be in less dangerous range and over a much longer time cycle than in the case of chromium-iron alloys.—Page 889.

* * *

Chromium is what makes chromium-nickel alloys corrosion-resistant, says metallurgist. The nickel additions, he believes, are valuable more particularly in regard to their bearing on physical properties.—Page 889.

* * *

Oscillating the ingot mold during solidification produces an ingot having an outer columnar shell about 1½ in. thick, with normal carbon. There is a very sharp transition to small random crystals.—Page 894.

* * *

Errors in hoist manipulation are reduced by using arrow heads as hand-pulls. The arrow head pointing up lifts the load and the one pointing down lowers it.—Page 895.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Commodity Price Prospects

THAT the general commodity price average has changed but little in the rising tide of prosperity of the last few years has given the economists no little concern, for the theory has been that rising prices and prosperity were interlocked. To ordinary business men the course has seemed more natural. A combination of competition and "sales resistance," or the determination of buyers not to pay advances, has held prices substantially stationary and increased profits where obtained have been through the medium of cost reduction.

Should there be just a mild reaction in trade activity—what then? There has been a theory that a long-range tendency of prices to decline after a great war has been offset of late by increasing activity, whereby in essence there was a price advancing tendency, prevented from working out into the actual figures by the other trend. Should both trends coincide in direction, the course of prices would presumably be different.

Despite the many new things, we should still be able to get some useful information from the past. In the light of fuller knowledge we should be able to interpret the past better now than was possible at the time. What is the theory that will explain satisfactorily the 50 per cent advance in prices from 1897 to 1913? The low point of all time fell in 1897 and the Bureau of Labor's general index number rose a trifle over 50 per cent to 1913. The ascent was almost uniform, there being merely short backsets in 1901, 1908-9 and 1911. It is true that times had been bad for several years prior to 1897 and were still bad, but there was a veritable "boom" in 1899 and there were periods of particularly intense activity in 1902 and in 1905-6-7; but after that, and into October of 1913 the price average continued to advance.

By observing the advances in individual groups of commodities from 1897 to 1913 one finds something that is of particular interest and value at the present time. With 50.6 per cent increase in the general commodity average in the 16 years, the group farm products advanced 95 per cent and foods and food products went up 56 per cent, a large increase in them being unavoidable when farm products advanced so much. The various other groups increased only between 32 and 49 per cent, except that lumber and building materials went up 68 per cent. The groups that advanced 32 to 49 per cent were cloth and clothing, fuel and lighting, metals and implements, drugs and chemicals, house furnishings and miscellaneous.

When the quantitative theory of money could not possibly explain these divergences, it is not worth

while to consider in detail what influence it may have contributed to the general average. The notable thing is the large advance in farm products and it is obvious that this had something to do with the increases in the other groups. If farm products had not advanced as they did the other commodities would not have gone so high. Incidentally it has been a particularly lucky thing for the farmers that 1913 chanced to be selected for the comparisons of recent years.

The United States Government is now engaged in a serious effort to improve the position of the farmer, not so much by reducing his production costs as by raising his selling prices. There is no promise in this of lower costs for manufacturers and other producers and besides there is the continued downward trend in hours of labor.

The Ways of Investment Trusts

IF a corporate stock now selling at \$100 per share for the reason that it is yielding an annual dividend of \$5 should in the course of two or three years be put upon a \$10 basis its quotational value would become \$200 per share, assuming of course that economic conditions underwent no change affecting the satisfaction of investors.

In all probability if a corporation had such a success the abler investors would have sensed increasing earnings and upon the strength of their anticipatory buying the price for the stock would have advanced to \$200 long before a \$10 dividend rate were declared.

In the course of the advance there doubtless would be many fluctuations, undulating above and below an ascending line, and it is conceivable that a speculating investor starting with 100 shares, repeatedly selling out and buying back, might find himself at a final liquidation at \$200 with a profit of \$20,000 instead of \$10,000.

In the converse instance of declining value all of the foregoing would be written in the opposite.

Of course, what we have remarked hereinbefore is thoroughly trite. Even so it helps in the understanding of investment trusts—their philosophy, operation, etc.—which have become a highly important thing in our economic affairs. It has been estimated that their aggregate capitalization now runs to something like 2.5 to 3 billion dollars, which probably is only a guess. However, the amount is undoubtedly very large.

The subject is too big and too ramifying for comprehensive discussion in a single editorial. Nevertheless there are certain principles that stand out clearly and may be broadly stated. The investment trusts express to the public the idea that they can handle money better than can the ordinary, even the average,

individual; and so much better that the yield to their clients is improved, although a large administration expense and a luscious commission have previously been deducted. It is clear from the exposition above, however, that the investment trust does not create any wealth, credit, or anything else. Using the term money in the vernacular, whatever the investment trust makes some one else does not make. There is simply a change of destination. Metaphorically the investment trusts may be described as the lions of Wall Street with whom the lambs lie down and become fat while the wolves grow lean, even to famishing. Of course, there will be instances of wolves disguising themselves as lions, and their particular lambs will not become fat.

Some of the superior investment trusts maintain extensive staffs of engineers and economists and base their commitments, or fill their portfolios (as financial writers like to say), upon the most intelligent and meticulous study. Others operate only on their commercial sense, or instinct. Still others govern themselves upon no other principle than the control of heaps of money. Analogously the investment trusts run the gamut from the exploration company to the speculative pool. Investment trusts of the latter type, that merely play the market, may be expected to explode every now and then, as happened to a little one lately. The sounder ones, which no doubt constitute the great majority, buying for dividends and increment, borrowing no money, are probably safe so long as our national economy is safe, although perhaps their income and profit may not always be so large as at present. After all, their position is much the same as that of the investment department of a university, or of an insurance company, or of a powerful individual, although there are certain important points of difference.

Your Convention Money's Worth

CONVENTIONS are a problem to many an employer. Do his representatives get a return in new knowledge and experience in any fair proportion to the money spent? Frequently not. Many pay too little attention to technical sessions and even less to the new features of the exhibition, if there is one. "Too many parties" is often the complaint. And yet the employer feels that he must be well represented.

A new departure was made recently and with apparent success by a large agricultural implement organization operating several plants. The chief metallurgist brought with him a group of his assistants. Each morning at breakfast the day's program (at the National Metal Congress in Cleveland) was gone over. Then selected individuals were given assignments to certain sessions or to visit designated departments of the exposition. At night, usually at dinner, the group came together and the members reported their impressions and discussed the papers. Often new ideas brought out in talks with fellow steel treaters were the topic.

While the subject of convention methods and results is up, it may be added that very recently the attitude of various industrial executives toward certain forms of entertainment has undergone a change. President Hoover's efforts for a more general observance of prohibition laws are the moving cause. We

have in mind companies whose record for convention wetness has been well known, who are now taking their stand with the President and putting a ban on the serving of liquor by their sales departments from hotel room sideboards.

The Next Advance in Welding

AMONG the dozens of unexplained facts about welding is the following, which is fairly well known to the workmen: That if a piece of welding wire is merely rubbed bright with fine emery cloth, it is impossible to do satisfactory work with it. That is a very curious fact. But the present purpose is not so much to speculate upon the influence of a microscopic film of mill scale as to emphasize that *some* coating is necessary to stabilize the arc in metallic electrode welding. This is a first principle recognized by welding wire makers. A popular plan is to give the wire a copper coating; but each manufacturer has his own ideas about the most efficient way to give the so-called "bare electrode" its correct surface.

A few have reasoned that if some coating is absolutely essential, a little more would improve the welding characteristics, and consequently they have exploited the "covered electrode." Many varieties are now available, and have been developed independently by experimenters in America, England and on the Continent. Eventually we shall doubtless organize these isolated developments into systematic knowledge of what constituents are essential and what are merely psychological.

At present it appears that covered electrodes have these pronounced advantages: The arc wanders less than when using bare electrodes, thus permitting a higher current density and a greater rate of metal deposition. Further, the coating melts into a fusible slag which protects the weld metal from the atmosphere and thus improves its soundness and ductility. Counterbalancing these are the drawbacks that the covered electrodes are expensive and often fragile. Furthermore, the slag must be cleaned off the weld (a particular job when more than one layer must be deposited in a thick joint) and this extra operation is costly.

From the great preponderance of "bare" electrodes used in metallic arc welding, both manual and automatic, it may be concluded that the disadvantages of such covered electrodes as have been exploited more than offset the advantages. It is our belief, however, that this eminently practical conclusion is due to the fact that the covered electrode idea has not yet been developed to its logical limit—at least by companies that are in the business of making and selling welding equipment. The same cannot be said of certain firms who are much interested in automatic welding as a production process.

A specification for a really fine covered electrode would include the following important points: The covering material should be tough and adherent enough to stand shop handling; non-hygroscopic and stable in temperate climate. The covering material and the electrode should vaporize at the same rate, and the gas from the former should effectually prevent reaction between the white hot iron atoms and oxygen or nitrogen in the surrounding air. The vapor from the covering material should be a non-conductor

of electricity, or at least of such a nature as to concentrate the stream of electrons within a small area, thus stabilizing the arc, and increasing the rate of deposition of a superheated fluid steel. The slag from the melted covering should separate cleanly from the weld metal—no included particles. The slag should be a poor conductor of heat so that the weld metal may slowly cool, and have an annealed, fine-grained structure. The slag should solidify into a brittle mass, easily and cleanly removed from the underlying bright metal. For automatic welding the coating should be applied continuously just before using.

An ideal state; an impossible set of specifications? By no means. That the problem is not impossible is proved by the fact that it certainly has been solved already by at least two organizations (and perhaps more) working entirely independently. That the welding rate under such conditions is extraordinarily high is an open secret. That the quality of the welded joint is beyond reproach has been demonstrated by exhaustive tests.

When is the welding industry generally going to take these facts to heart and act accordingly?

Wide Field for Conveyor Systems

THAT mechanical conveyors can be successfully used only by large plants and in mass production is an idea still prevalent, but disproved by the experience of not a few companies. Some specific cases come to mind.

A Middle Western gray iron foundry making only three tons of castings a day has been equipped with conveyors after the fashion of the large automobile foundries and with a saving in men and space. An Ohio pump manufacturer of modest size has organized its factory on a progressive assembly plan with conveyors serving as the main stem in the production scheme. A New England machine shop has recently become more profitable through the use of material handling equipment.

Where conveyors cannot be employed in sub-assembly operations because of the nature of the work, they often can be made to solve the main assembly problem. Where they do not fit economically into the general manufacturing plan, frequently they can be used to lower the expense of certain operations. The point is that today no manufacturer, no matter how large or small, can overlook the possibilities of machine conveyors without risk of suddenly finding that a rival's vigilance in cutting production costs has allowed the latter to sell his product more cheaply.

Another popular belief is that the flow of materials through a plant must constantly be at a high rate in order to make mechanical conveyors profitable. That this cannot be applied as a blanket rule appears from the experience of a manufacturer of radio sets who installed a web of conveyors reaching into practically every department. The company's production for a time fell some 65 per cent below what the conveyors had been designed to handle, and yet the plant engineers estimated that, even though operations went on with no increase upon that rate, the conveying system would fully pay for itself within nine months.

Changing Production of Fuels

IN six years, 1923 to 1929, production of coal, petroleum and natural gas has increased about 5 per cent, as is shown when the three are added together on a heat-unit basis. The proportions, however, are greatly altered. Bituminous coal has lost about 10 per cent and anthracite nearly one-fourth, while oil has increased nearly a third and natural gas has increased by about two-thirds. Total B.t.u. represented were a trifle under 23 quadrillions in 1923 and will probably be measurably under 24 quadrillions this year.

The change in distribution is the interesting thing, represented by the following approximate figures:

<i>Proportion of Heat Units</i>		
	1923	1929
Bituminous coal	65.0	58.6
Anthracite	11.1	8.5
Petroleum	19.2	25.1
Natural gas	4.7	7.8
Total.....	100.0	100.0

The course of natural gas production is of particular interest, and especially to the steel trade, seeing what a large demand there has been lately for line pipe for natural gas movement. The first statistics of natural gas production were for 1915, showing 628,578,842 thousands of cubic feet. Statistics for last year have just been issued, at 1,568,139,000 thousand cubic feet. Natural gas became a great thing for the Pittsburgh district in the eighties of the last century and a life saver for the infant tin plate industry in the next decade. The tin plate mills grouped in Indiana were called "the gas belt mills" and much glass manufacture was attracted to the same region.

Some of the older gas regions played out entirely, while others lost only slightly, but there have been big discoveries out west. The statistics show substantially uniform production for 1915 to 1922 inclusive; then large annual gains appeared, last year's production being double the average for the eight years through 1922. In each of the last three years there has been in the neighborhood of 10 per cent increase, and with the large number of gas lines laid recently, it is safe to estimate this year at 10 per cent over last year, or at somewhat more than 1,700,000,000 thousand cubic feet.

Petroleum will show a substantial gain over last year, probably about 11 per cent, to one billion barrels. There was a very large gain but restrictive measures have lately come to apply. The 1923 production was 732,407,000 barrels.

Comparison between 1923 and 1929 is not altogether fair to coal, for the reason that production in 1923 was stimulated after a strike year. Bituminous production this year, while below that of 1923, will be above that of any intermediate year except 1926. Anthracite production has been slipping slowly, in part because of strikes and consequent resort to fuel oil and gas. It had shown a distinctly standard rate at 90,000,000 tons until, in two war years, there was an excess of about 10 per cent. For several years after the war the old rate was in evidence, but now 75,000,000 tons is approximately the measure.

Continuous Sheet Process Licensed to Republic

The American Rolling Mill Co. has licensed its entire patent structure, covering processes for the rolling of wide thin sheets, to the Republic Iron & Steel Co., according to an announcement by George M. Verity, president of the American Rolling Mill Co.

This makes the fifth steel company to be licensed by the American Rolling Mill Co. Those granted licenses heretofore are the Weirton Steel Co., the Wheeling Steel Corporation, the United States Steel Corporation and the Gulf States Steel Co.

Rockwell Company Opens Its New Plant

The new home of the Stanley P. Rockwell Co., Hartford, Conn., at 296 Homestead Avenue, is announced as completed. It is an attractive building, equipped for the manufacture and servicing of the Rockwell dilatometer and other products of the company. A cordial invitation to inspect the new plant is extended to those interested.

Ornamental Iron and Bronze Makers to Meet

The twenty-second annual convention of the National Association of Ornamental Iron and Bronze Manufacturers will be held at Hotel Jefferson, St. Louis, Oct. 8 to 11. The program will include the following speakers: Harry F. Huff, manager, Kenosha, Wis., branch of the American Brass Co., on "History and Progress of Anaconda Extruded Metals"; Dr. Hugh P. Baker, manager, Trades' Association Department of the United States Chamber of Commerce, on "Trade Associations and American Business"; Harry A. Einstein, representative, Credit Clearing House Adjustment Corporation, New York, on "The Value of the Trade Association Credit and Collection Service," and C. C. Johnston, credit manager, St. Louis branch of Joseph T. Ryerson & Sons, Inc., on "Cost Accounting."

Crucible Buys Interest in Shenango Mines

The Shenango Furnace Co., Pittsburgh, announces the sale to the Crucible Steel Co. of America of a large interest in its extensive iron ore holdings located on the Mesabi range, St. Louis County, Minnesota, which will insure a supply of ore for Crucible Steel for about 30 years.

An operating company will be formed, the ownership of which will be held by the Crucible and Shenango interests. The present organization of the Shenango Furnace Co. will continue to operate the properties, as it has been active in the iron mining industry in the Lake Superior region for

many years under the guidance of the W. P. Snyder interests. By this new deal these two old Pittsburgh concerns will be closely affiliated in future.

The ore produced from the different properties will be mostly consumed by the Shenango and Midland furnaces. The two largest properties figuring in the sale are the Shenango mine, which has been one of the big producers for

many years, and the Webb mine, which has only recently been producing on a large scale. Both properties are operated by open pit mining.

By Crucible's purchase of a substantial part of these ore reserves it places itself in an independent position on raw materials, as the company already has ample coal and limestone properties to care for its requirements for many years.

The Week in Business

Drift of Current Financial and Economic Opinion

OPTIMISM seems to have become its own nemesis, so far as the stock market is concerned. The manifestly bright prospects for industry, particularly in this country, caused a world-wide rush to share in its future prosperity. But the speculation that ensued reached such proportions as to consume funds needed to insure the realization of business expectations.

The increase in discount rate of the Bank of England from 5½ to 6½ per cent in the past week is the latest of a series of central bank rate changes traceable to the demand for call money in the United States. Since Jan. 1, according to the New York *Herald-Tribune*, there have been 21 such rate changes, all but two being advances.

The English rate is now the highest since 1921 and, in the view of D. W. Ellsworth of the *Annalist*, will entail readjustments in international financial relations that are likely to react unfavorably on business in this country. A temporary slackening of activity, however, is the very thing needed to keep business on a sound and enduring basis, in the opinion of the National City Bank of New York, since it would have a sobering influence on speculative sentiment.

Commercial and Financial Chronicle takes a less sanguine view. In commenting on the further rise of brokers' loans to a new peak it says, "The full measure of the ill consequences in this last particular still remains for the future to determine."

This journal traces the origin of the stock market boom to the easy money policy inaugurated by the Federal Reserve authorities in the summer of 1927, when rediscount rates were reduced to the very low figure of 3½ per cent and the coun-

try was flooded with Reserve credit by the hundreds of millions through the purchase of Government securities. The purpose of the move was to divert bullion to Europe to help certain countries, notably Great Britain and France, to return to the gold standard. But, the *Chronicle* adds, the absorption of bank credit in stock speculation forced Europe "to yield up again the gold which Federal Reserve policy had so graciously placed at its disposal."

The general level of commodity prices, the Harvard Economic Society says, may weaken further over the remainder of the year. Continued firm money is in prospect; and in the fourth quarter the depressing influence of this condition upon foreign exchanges—and hence upon European commodity prices—is aggravated by the large seasonal expansion in export trade.

Certain it is that higher money rates in Great Britain will hamper the financing of its grain purchases. This factor must be taken into account in appraising the American agricultural situation. Our crop yields, according to an estimate by the Alexander Hamilton Institute, will show an average decrease of 9 per cent from those of 1928. The net result, in the belief of the Corn Belt Farm Dailies, is likely to be as many farm dollars as during the past year, but rather unevenly distributed. "It will be a very prosperous year for some farmers and a rather poor year for others."

The country as a whole, in the opinion of the Hamilton Institute, will be adversely affected. "Farm labor will not be so well employed, railroads will suffer from a reduction in freight, the nation's food bill will be increased and the people will have less money to spend for clothes, furniture, automobiles and other items which contribute to prosperity."

A Record September in Iron Output

Daily Rate Less Than August by 4.6 Per Cent or 5598 Tons—Nine Months' Total 1,553,500 Tons Over Next Largest—Net Loss of Five Furnaces

WITH all furnaces reporting and with only a few which could not give actual totals, data collected by wire on Oct. 1 show that September pig iron output established a new record for that month. A new total for the first nine months of any year was also registered.

September production was at the rate of 115,553 gross tons per day, a decline of 5598 tons or 4.6 per cent

from the August rate of 121,151 tons per day. The nearest approach to this for September was 113,942 tons per day in 1918. The September total was 3,466,611 tons or 115,553 tons per day for the 30 days, as compared with 3,755,680 tons or 121,151 tons per day for the 31 days in August. The September daily rate is the smallest since February this year when it was 114,507 tons. In Sep-

tember a year ago the daily rate was 102,077 tons.

Operating Rate on Oct. 1

There were 205 furnaces operating on Oct. 1 having an estimated operating rate of 115,190 tons per day. This compares with an operating rate of 119,130 tons per day for the 210 furnaces active on Sept. 1. Nine furnaces were shut down and four were

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1925—Gross Tons

	1925	1926	1927	1928	1929
Jan.	108,720	106,974	100,123	92,573	111,044
Feb.	114,791	104,408	105,024	100,004	114,507
Mar.	114,975	111,032	112,366	103,215	119,822
Apr.	108,632	115,004	114,074	106,183	122,087
May	94,542	112,304	109,385	105,931	125,745
June	89,115	107,844	102,988	102,733	123,908
½ year...	105,039	109,660	107,351	101,763	119,564
July	85,936	103,978	95,199	99,091	122,100
Aug.	87,241	103,241	95,073	101,180	121,151
Sept.	90,873	104,543	92,498	102,077	115,553
Oct.	97,528	107,553	89,810	108,832	.....
Nov.	100,767	107,890	88,279	110,084	.....
Dec.	104,853	99,712	86,960	108,705	.....
Year	99,735	107,043	99,266	103,382	.....

Pig Iron Production by Districts, Gross Tons

	Sept. (30 days)	Aug. (31 days)	July (31 days)	June (30 days)
New York and Mass.	235,818	253,889	256,697	246,124
Lehigh Valley	82,097	88,395	95,571	102,302
Schuylkill Valley	69,413	74,871	71,350	70,265
Lower Susq. and Lebanon Valleys	37,900	37,706	37,775	44,651
Pittsburgh district	743,222	827,285	815,045	787,313
Shenango Valley	141,436	129,835	144,455	148,675
Western Pennsylvania	131,052	150,272	146,886	143,474
Maryland, Va. and Ky.	114,401	115,804	123,447	117,250
Wheeling district	125,009	130,296	127,136	123,450
Mahoning Valley	354,187	368,609	373,181	372,030
Central and North'n Ohio	359,420	377,604	387,383	374,138
Southern Ohio	46,992	54,842	52,232	46,345
Illinois and Indiana	702,234	773,150	772,276	771,070
Mich., Minn., Mo., Wis., Colo. and Utah	131,329	147,992	146,304	131,514
Alabama	182,427	205,209	225,513	219,235
Tennessee	9,674	9,921	9,869	9,389
Total	3,466,611	3,755,680	3,785,120	3,717,225

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
September, 1928	82,590	19,487	102,077
October	88,051	20,781	108,832
November	88,474	21,610	110,084
December	85,415	23,290	108,705
January, 1929	85,530	25,514	111,044
February	89,246	25,261	114,507
March	95,461	24,361	119,822
April	95,680	26,407	122,087
May	100,174	25,571	125,745
June	99,993	23,915	123,908
July	98,044	24,056	122,100
August	98,900	22,251	121,151
September	93,914	21,639	115,553

*Includes pig iron made for the market by steel companies.

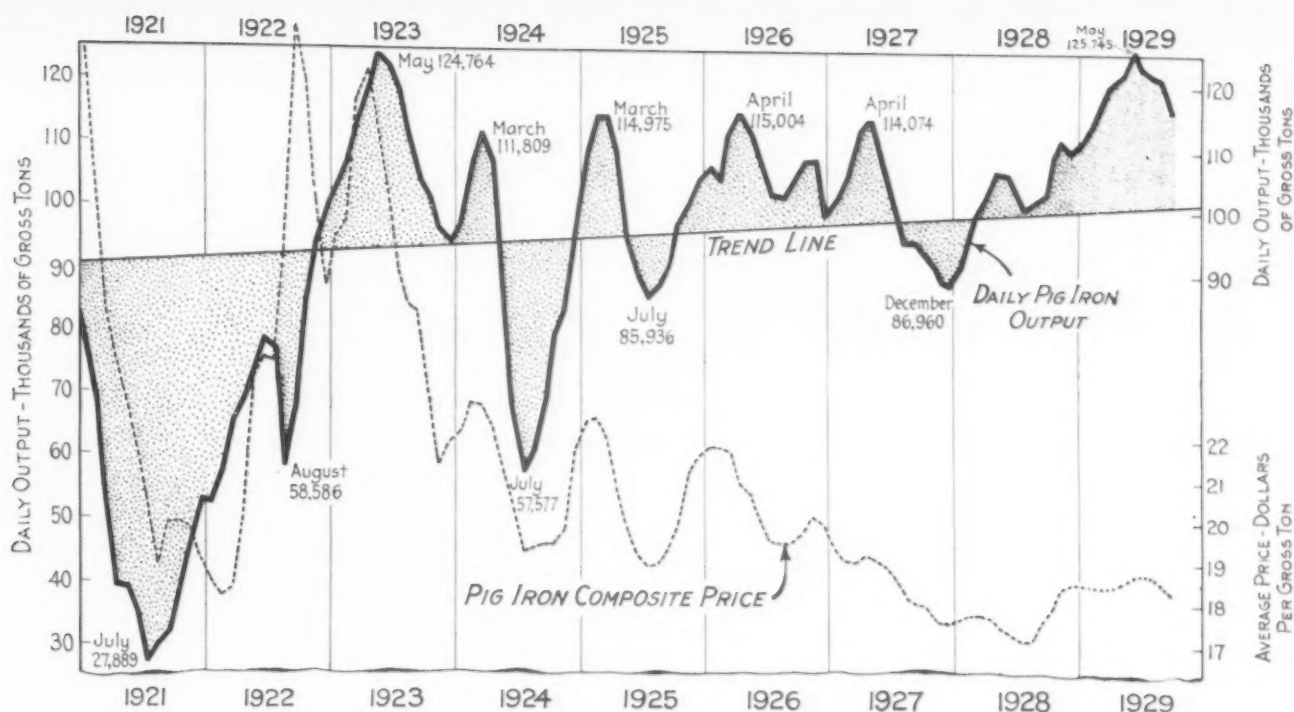
Coke Furnaces in Blast

	Oct. 1		Sept. 1	
	Number in Blast	Gross Tons per Day	Number in Blast	Gross Tons per Day
New York:				
Buffalo	14	7,245	14	7,320
Other N. Y. and Mass.	2	615	2	595
New Jersey	0	.....	0	.....
Pennsylvania:				
Lehigh Valley	7	2,735	7	2,290
Schuylkill Valley	5	2,315	5	2,415
Susquehanna Valley	2	1,230	2	1,215
Perromanganese	0	.....	0	.....
Lebanon Valley	0	.....	0	.....
Perromanganese	0	.....	0	.....
Pittsburgh District	39	24,280	40	25,380
Ferro. and Spiegel	3	460	3	540
Shenango Valley	8	4,370	8	4,510
Western Pennsylvania	9	4,320	9	4,510
Perromanganese	2	390	2	385
Maryland	5	2,985	6	3,220
Wheeling District	7	4,165	7	4,200
Ohio:				
Mahoning Valley	20	12,600	20	12,400
Central and Northern	18	11,425	19	12,000
Southern	4	1,565	4	1,770
Illinois and Indiana	32	22,650	35	24,940
Mich., Wis. and Minn.	6	2,820	6	2,825
Colo., Mo. and Utah	4	1,860	3	1,430
The South:				
Virginia	0	.....	0	.....
Perromanganese	1	90	1	95
Kentucky	2	730	1	415
Alabama	13	6,020	14	6,360
Perromanganese	0	.....	0	.....
Tennessee	2	320	2	315
Total	205	115,190	210	119,130

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1927—Gross Tons

	1927	1928	1929
Jan.	3,103,820	2,869,761	3,442,370
Feb.	2,940,679	2,900,126	3,206,185
Mar.	3,483,362	3,199,674	3,714,473
Apr.	3,422,226	3,185,504	3,662,625
May	3,390,940	3,283,856	3,898,082
June	3,089,651	3,082,000	3,717,225
½ year	19,430,678	18,520,921	21,640,960
July	2,951,160	3,071,824	3,785,120
Aug.	2,947,276	3,136,570	3,755,680
Sept.	2,774,949	3,062,314	3,466,611
9 mos.	28,104,063	27,791,629	32,648,371
Oct.	2,784,112	3,373,806	.....
Nov.	2,648,376	3,302,523	.....
Dec.	2,695,755	3,369,846	.....
Year*	36,232,306	37,837,804	.....

*These totals do not include charcoal pig iron. The 1928 production of this iron was 142,960 gross tons.



Production of Pig Iron So Far This Year Has Averaged Slightly Over 120,000 Tons a Day

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 423,000 tons

blown in during September—a net loss of five furnaces. This compares with a net loss of six furnaces in August.

No merchant furnaces were blown in or out last month. The Steel Corporation sustained the largest loss—one blown in and six shut down. Independent steel companies blew in three and shut down three. The net loss of five for the month was in steel-making furnaces.

Nine Months Make a New Record

For the nine months ended with September the total output was 32,648,371 tons. The nearest approach to this for the same period was 31,094,873 tons in 1923, an increase of 1,553,498 tons or 5 per cent.

Large Loss in Steel-Making Iron

There was a loss of 4986 tons per day, or 5 per cent, in steel-making iron or 93,914 tons per day for September compared with 98,900 tons per day for August. The merchant loss was only 612 tons per day.

September Output of Ferromanganese

Ferromanganese output in September was 27,310 tons which compares with 28,461 tons in August. It was the fifth largest this year. Two companies were making spiegeleisen last month.

Furnaces Blown In and Out

Among the furnaces blown in during September were one Ashland furnace of the American Rolling Mill

Co. in Kentucky, No. 3 Ohio furnace of the Carnegie Steel Co. and one Campbell furnace of the Youngstown Sheet & Tube Co. in the Mahoning Valley, and one furnace of the Colorado Fuel & Iron Co. in Colorado.

Among the furnaces blown out or banked during September were No. 1 Isabella furnace of the Carnegie Steel Co. in the Pittsburgh district, C furnace at the Maryland plant of the Bethlehem Steel Corporation, No. 6 Ohio furnace of the Carnegie Steel Co. and Grace furnace of the Youngstown Sheet & Tube Co. in the Mahoning Valley, one furnace of the National Tube Co. for complete relining in Northern Ohio, two South Chicago furnaces of the Illinois Steel Co. and one Gary furnace in the Chicago district, and No. 3 furnace of the Sloss Sheffield Steel & Iron Co. in Alabama.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1927	1928	1929	1927	1928	1929
Jan.	2,343,881	2,155,133	2,651,416	31,844	22,298	28,208
Feb.	2,256,651	2,274,880	2,498,901	24,560	19,320	25,978
Mar.	2,675,417	2,588,158	2,959,295	27,834	27,912	24,978
Apr.	2,637,919	2,555,500	2,826,028	24,735	18,405	22,413
May	2,619,078	2,652,872	3,105,404	28,734	29,940	25,896
June	2,343,409	2,448,905	2,999,798	29,232	32,088	33,363
½ year.....	14,876,355	14,675,448	17,040,842	166,939	149,963	160,836
July	2,163,101	2,464,896	3,039,370	26,394	32,909	31,040
Aug.	2,213,815	2,561,904	3,065,874	21,279	24,583	28,461
Sept.	2,090,200	2,477,695	2,817,427	20,675	22,278	27,310
9 mos.	21,343,571	22,179,943	25,963,513	235,287	230,733	247,647
Oct.	2,076,722	2,729,589	.....	17,710	23,939	.....
Nov.	1,938,043	2,654,211	.....	17,851	29,773	.....
Dec.	1,987,652	2,647,863	.....	20,992	28,618	.....
Year	27,345,888	30,211,606	.....	291,840	312,061	.....

*Includes output of merchant furnaces.

The Pittsburgh Steel Co. and subsidiaries, for the year ended June 30, 1929, shows net income for that period of \$4,535,437. After deductions for dividends on common and preferred stock, total surplus for the year was \$3,041,687. During the year the company shipped 532,565 net tons of steel products. The average number of employees at steel works was 6153, and total salaries and wages paid amounted to \$12,899,142.

Minnesota Steel Co., Duluth, Minn., has filed plans for a one-story addition to its merchant mill, to be equipped primarily for production of steel fencing, reported to cost about \$100,000.

Iron and Steel Markets

Further Drop in Automobile Output

Two Leading Makers of Low-Priced Cars to Suspend Operations

—Railroad Demand Still Expanding—Sheet

Prices Weak—Scrap Lower

AUTOMOTIVE demand for finished steel has undergone a further slump, in contrast with the expanding requirements of the railroads and the sustained needs of the structural steel industry and other avenues of consumption.

The two leading makers of low-priced automobiles, both of which are bringing out new models, are scheduled to shut down their plants this month, one for two to four weeks and the other for 30 days. Although several motor car builders are preparing to get under production on new models about Nov. 1, the industry's operations during the rest of the year are unlikely to show much recovery.

Meanwhile railroad buying of both rails and equipment is assuming larger proportions. The Santa Fe has purchased 87,200 tons of rails, and the Monon, 4500 tons, while the formal distribution of orders by the Chesapeake & Ohio, Pere Marquette and Hocking Valley called for a total of 79,256 tons. The New York Central is in the market for 200,000 tons, to which 14,000 tons may be added for new lines. The Pennsylvania's inquiry for 310,000 tons is the largest it ever put out.

Orders for track accessories, the trend of which is upward, will call for at least 30 per cent of the tonnage of the rails bought, compared with 20 per cent a decade ago.

Rolling stock purchases include 3700 freight cars, nearly 1000 car bodies and 73 locomotives. Counting 7000 cars to be bought by the Baltimore & Ohio, approximately 6000 each by the Chesapeake & Ohio and the Santa Fe, 4000 by the Southern, 2700 by the Burlington and 1900 by the North Western, freight equipment orders definitely in sight total 30,000 units.

Mills serving the railroads and the construction industry, in contrast with those primarily dependent on the motor car manufacturers, have undergone the smallest reduction in operations and may show a gain this month. From the standpoint of weather conditions, October is an ideal production period and in past years has usually been the peak month of the last half of the year.

To fill up gaps in rolling schedules railroads and others are cooperating with producers by speeding up their specifications. A Chicago mill is already rolling 12,000 tons of plates for 1000 St. Paul cars, and the A. O. Smith Corporation, Milwaukee, which has booked two California line pipe orders, is releasing orders against the 69,000 tons of plates required.

Demands from the farm equipment industry, partly because of foreign orders for tractors, have improved. Fabricated structural steel lettings are large, totaling 50,000 tons, against 35,000 tons last week.

Additions to pending work, amounting to 54,000 tons, include 17,000 tons for New York subway sections and 12,000 tons for a Chicago office building.

While ingot output for the steel industry at large has declined further and the lull in automobile manufacture will tend to offset heavier demands from other sources, it is possibly significant that the Steel Corporation rate, 89 per cent, shows a gain of a few points. Production of independents, on the other hand, probably does not average more than 80 per cent, with some of them running as low as 75 per cent of capacity.

Pig iron production in September totaled 3,466,611 tons, or 115,553 tons a day. While this was the largest output for any ninth month, it showed a decline from August, in terms of daily rate, of 4.6 per cent. Four furnaces were blown in and nine blown out, all of them steel company stacks, making a net loss of five stacks for the month. Output for the nine months, at 32,648,371 tons, established a new record, surpassing the previous high total, for the corresponding period in 1923, by 5 per cent.

Finished steel prices have developed further weakness, notably in sheets and wide strip, on which concessions are more common. Wire nails, despite the recent reduction in price, are very irregular, particularly in some parts of the Chicago district.

Scrap markets continue to weaken, and heavy melting steel has undergone a further decline of 25c. at Pittsburgh and 50c. at Chicago.

Pig iron demand has subsided, following a fair volume of contracting for fourth quarter. Melt is well sustained except in sections where automobile business is an important factor. Southern competition in Northern markets has diminished and surplus steel company iron has not yet disturbed prices. A purchase of 5000 tons of basic by a steel foundry failed to break the Valley market of \$18.50, furnace.

Exports of iron and steel in August, at 242,856 tons, were the smallest of any month this year. Imports, at 83,869 tons, were the largest since September, 1926.

The International Steel Cartel has been renewed provisionally until the end of March, with production quotas unchanged for the fourth quarter. The International Rail Makers' Association has reaffirmed its prices.

Both of THE IRON AGE composite prices are unchanged, finished steel at 2.384c. a lb. and pig iron at \$18.29 a gross ton. The former is 44c. a net ton higher than a year ago, the latter 45c. a gross ton higher.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Oct. 1, 1929	Sept. 24, 1929	Sept. 3, 1929	Oct. 2, 1928
No. 2 foundry, Philadelphia...	\$21.26	\$21.26	\$21.26	\$20.76
No. 2, Valley furnace.....	18.50	18.50	18.50	17.00
No. 2 Southern, Cin'ti.....	17.19	17.19	17.19	19.94
No. 2, Birmingham.....	14.50	14.50	14.50	16.25
No. 2 foundry, Chicago*	20.00	20.00	20.00	18.50
Basic, del'd eastern Pa.....	19.75	19.75	19.75	19.00
Basic, Valley furnace.....	18.50	18.50	18.50	17.00
Valley Bessemer, del'd P'gh..	20.76	20.76	20.76	19.01
Malleable, Chicago*	20.00	20.00	20.00	18.50
Malleable, Valley.....	19.00	19.00	19.00	17.25
Gray forge, Pittsburgh.....	19.76	19.76	19.76	18.26
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace....	105.00	105.00	105.00	105.00

Rails, Billets, Etc., Per Gross Ton:	Oct. 1, 1929	Sept. 24, 1929	Sept. 3, 1929	Oct. 2, 1928
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails, at mill.....	36.00	36.00	36.00	36.00
Re-rolling billets, Pittsburgh..	35.00	35.00	35.00	32.00
Sheet bars, Pittsburgh.....	35.00	35.00	35.00	32.00
Slabs, Pittsburgh.....	35.00	35.00	35.00	32.00
Forging billets, Pittsburgh...	40.00	40.00	40.00	38.00
Wire rods, Pittsburgh.....	40.00	42.00	42.00	42.00
Skelp, grvd. steel, P'gh, lb...	1.85	1.85	1.85	1.90

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.90	1.90	1.95	1.90
Bars, Chicago.....	2.05	2.05	2.05	2.00
Bars, Cleveland.....	1.95	1.95	1.95	1.92 1/2
Bars, New York.....	2.24	2.24	2.29	2.24
Tank plates, Pittsburgh.....	1.95	1.95	1.95	1.90
Tank plates, Chicago.....	2.05	2.05	2.05	2.00
Tank plates, New York.....	2.22 1/2	2.22 1/2	2.22 1/2	2.22 1/2
Structural shapes, Pittsburgh	1.90	1.90	1.95	1.90
Structural shapes, Chicago...	2.05	2.05	2.05	2.00
Structural shapes, New York...	2.19 1/2	2.19 1/2	2.19 1/2	2.19 1/2
Cold-finished bars, Pittsburgh	2.30	2.30	2.30	2.10
Hot-rolled strips, Pittsburgh...	1.90	1.90	1.90	1.75
Cold-rolled strips, Pittsburgh	2.75	2.75	2.75	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel, Per Lb. to Large Buyers:	Oct. 1, 1929	Sept. 24, 1929	Sept. 3, 1929	Oct. 2, 1928
Sheets, black, No. 24, P'gh...	2.85	2.85	2.85	2.75
Sheets, black, No. 24, Chicago	2.95	2.95	2.95	2.75
dist. mill.....	3.50	3.50	3.50	3.50
Sheets, galv., No. 24, P'gh...	3.60	3.60	3.60	3.60
Sheets, galv., No. 24, Chicago	2.35	2.35	2.35	2.10
dist. mill.....	2.45	2.45	2.45	2.20
Wire nails, Pittsburgh.....	2.45	2.45	2.55	2.55
Wire nails, Chicago dist. mill.	2.50	2.50	2.60	2.60
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.40
Plain wire, Chicago dist. mill.	2.45	2.45	2.45	2.45
Barbed wire, galv., P'gh.....	3.10	3.20	3.20	3.20
Barbed wire, galv., Chicago	3.15	3.30	3.30	3.25
dist. mill.....	5.35	5.35	5.35	5.25
Tin plate, 100-lb. box, P'gh...				

Old Material, Per Gross Ton:	Oct. 1, 1929	Sept. 24, 1929	Sept. 3, 1929	Oct. 2, 1928
Heavy melting steel, P'gh....	\$17.75	\$18.00	\$18.75	\$17.00
Heavy melting steel, Phila....	16.00	16.00	16.50	16.00
Heavy melting steel, Ch'go....	14.50	15.00	15.25	13.25
Carwheels, Chicago.....	14.00	14.00	14.00	13.75
Carwheels, Philadelphia.....	16.50	16.50	16.50	16.50
No. 1 cast, Pittsburgh.....	15.50	15.50	15.50	15.00
No. 1 cast, Philadelphia.....	16.00	16.00	16.50	17.00
No. 1 cast, Ch'go (net ton)...	14.50	14.50	14.50	15.00
No. 1 RR. wrot., Phila.....	16.00	16.00	16.00	15.50
No. 1 RR. wrot., Ch'go (net)	14.00	14.00	14.00	12.00

Coke, Connellsville, Per Net Ton at Oven:	Oct. 1, 1929	Sept. 24, 1929	Sept. 3, 1929	Oct. 2, 1928
Furnace coke, prompt.....	\$2.65	\$2.65	\$2.65	\$2.75
Foundry coke, prompt.....	3.75	3.75	3.75	3.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	18.12 1/2	18.12 1/2	18.12 1/2	15.25
Electrolytic copper, refinery...	17.75	17.75	17.75	15.00
Tin (Straits), New York....	44.25	45.25	45.50	49.75
Zinc, East St. Louis.....	6.80	6.80	6.80	6.25
Zinc, New York.....	7.15	7.15	7.15	6.60
Lead, St. Louis.....	6.70	6.70	6.55	6.32 1/2
Lead, New York.....	6.90	6.90	6.75	6.50
Antimony (Asiatic), N. Y. ...	8.50	8.62 1/2	8.62 1/2	11.50

Pittsburgh

Steel Demand Trend Still Indefinite, While Output Tapers —Railroad Needs Feature Market

PITTSBURGH, Oct. 1.—Pittsburgh district steel makers enter the last quarter of the year with the trend of demand rather undetermined and production still tending downward. Specifications during the last two weeks of September were at a considerably better rate on most products than they were during the first two weeks of the month, but they were still far from sufficient to maintain the operating rate which had prevailed during the summer months. At present most of the steel finishing departments are operating on a hand-to-mouth basis, although an exception might be made in the case of tin plate. The leading maker of this product has begun to work on anticipated tonnage. A few makers of sheets also have tonnage on their books which will carry them well into October, but such backlogs are rapidly being worked off as automobile demand for sheets tapers.

Railroad demand for steel continues to feature the market. Pittsburgh mills will undoubtedly share in the rail purchases of the Pennsylvania and the New York Central, both of which are to be slightly heavier than usual. Car buying also promises to continue. The Baltimore & Ohio has authorized the purchase of 7000 freight cars, from which local mills will likely benefit. Sheet makers in this district have received orders for galvanized material for cars recently.

Price concessions continue to appear on many products, although mills have not recognized this condition in their regular price schedules except on wire products. The weakness in nails and wire for the jobbing trade has not spread to manufacturers' wire, on

which makers are maintaining a firm price policy. Concessions of \$2 a ton on wire rods are being met in this district.

Recent price shading generally has not been among the regular customers of the larger mills, but has appeared

when other steel companies, not so well supplied with business, have sought orders from users whom they do not ordinarily serve.

Pig iron shipments during September were ahead of those in August, and orders placed during the month gave some producers comfortable backlogs. However, many large users have not covered their needs for the last quarter and moderate buying is expected to be well distributed over the closing months of the year.

The scrap market shows further softness as a result of another week of practically no mill buying, but prices will be clarified somewhat by the closing of the railroad lists in the next few days.

Pig Iron.—Shipments during September from Valley and local merchant furnaces were somewhat larger than in the previous month, and aggregate sales of local dealers were considerably heavier. This was expected in view of fourth quarter contracting. It is believed, however, that consumers in this vicinity have by no means fully covered their needs for the last three months of the year, and that buying will be fairly well distributed throughout the quarter. Merchant furnaces are making no large additions to their stocks, and thus far

steel companies have not aggressively pushed the sale of iron in this territory. Two large steel companies are normally the sellers of pig iron, but no others are reported to have come into the market. American Steel Foundries has bought basic iron for its Alliance, Ohio, plant at the full \$18.50, Valley, price. Price concessions are not reported in the market, although buyers are inclined to believe that the situation is not so strong as it was a short time ago. Foundry and basic iron are still quoted at \$18.50, Valley, and malleable and Bessemer at \$19, while the local furnace has quoted prices 50c. a ton higher.

Prices per gross ton, f.o.b. Valley furnace:	
Basic	\$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, \$1.75.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	\$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

Semi-Finished Steel.—As was the case at the beginning of the third quarter, buyers of semi-finished steel are hesitant in closing against their requirements for the last three months of the year. In some cases there is still some question as to the price on billets and slabs, while in others non-integrated companies have considerable steel coming to them on old contracts, and are in no immediate need of further supplies. Small users of billets, slabs and sheet bars have closed their fourth quarter contracts at \$35, Pittsburgh, and forging billets are bringing \$40. The weak price situation in wire and nails has been reflected in wire rods, and contracts have been taken at \$40, Pittsburgh and Cleveland. The price of skelp is unchanged at 1.85c. to 1.90c., Pittsburgh or Youngstown.

Bars, Shapes and Plates.—Business is still rather spotty, although September specifications of some companies do not show so large a de-

crease as was indicated by the tonnage released in the first two weeks of the month. Most mills have considerable plate tonnage on their books yet to be rolled, and the buying movement in freight cars, which is now getting under way, will contribute to backlogs. It will be several weeks, however, before the steel for cars now being placed will reach the mills in the form of specifications. Barge buying in prospect also promises to contribute to the plate tonnage for the remainder of the year, and there is a real shortage of barges on the Ohio River and its tributaries. The Standard Unit Navigation Co. is expected to issue specifications this week on the 50 steel barges which it announced last week as probable purchases. Other barge work is also in prospect, although not many general inquiries have yet reached the trade. Structural business also looks more favorable. The Board of Commissioners of Allegheny County is expected to issue plans this month for a bridge across the Ohio River at McKees Rocks, Pa., which will require 15,000 tons. Another large bridge at Turtle Creek, Pa., is in prospect, and will require a large tonnage. Awards this week include a bridge at Point Marion, Pa., calling for 850 tons. Reinforcing bar business is still fairly active, and it is expected to keep up for several weeks before winter weather interferes with construction. Prices on bars and shapes are weak, and although some mills are still quoting 1.95c. on fourth quarter business, considerable tonnage is going at 1.90c. Concessions from 1.95c. on plates are not common in this territory.

Bolts, Nuts and Rivets.—Makers have no difficulty in signing up fourth quarter contracts at 70 per cent off list for bolts and nuts, and 70 and 10 on small rivets. The price of large rivets is unchanged at \$3.10 a 100 lb., Pittsburgh or Cleveland. Makers have felt the falling off in automobile tonnage during the last month or six weeks, but operations for the industry as a whole average 65 to 70 per cent of theoretical capacity. The railroad car builders are expected to

require large tonnages in the closing months of the year.

Rails and Track Accessories.—The Pennsylvania Railroad has issued its 1930 rail requirements, the total of 310,000 tons exceeding that of last year by 38,000 tons. The New York Central inquiry for 200,000 tons is also larger than last year's. Pittsburgh mills did not share heavily in the Chesapeake & Ohio tonnage, which was placed last week. The Baltimore & Ohio, which is soon expected to come into the market for 7000 freight cars, has not yet announced its next year's rail requirements. September shipments of track accessories were fairly good for this time of the year. This is the off season for such business, and improvements will not begin for another two months.

Sheets.—Attention in this market is centered largely on prices, as buyers are seeking lower quotations on fourth quarter tonnage. Mills, particularly the larger interests, are taking a firm stand on prices. However, some shading is occurring on all the common finishes of sheets and it remains to be seen whether concessions will become common enough to justify lower quotations. A few makers are still quoting 3.60c., Pittsburgh, on galvanized sheets, although 3.50c. is becoming a more common price. Black sheets are unchanged at 2.85c., Pittsburgh, and shading has not become general except to large Michigan buyers who ordinarily enjoy a preferential price. On light plates and blue annealed sheets, the common quotations are 2.20c. and 2.35c., Pittsburgh, respectively, although \$2 a ton concessions are not infrequent. There is also occasional shading of the 4.10c. price on automobile body sheets. Fourth quarter contracting on the part of large users is still being delayed, but many consumers will have shipments coming to them during the greater part of October and a few mills still have sufficient backlogs to last for three or four weeks. The leading interest is still operating at close to 90 per cent of capacity and the independents

THE IRON AGE Composite Prices

Finished Steel

Oct. 1, 1929, 2.384c. a Lb.

One week ago	2.384c.
One month ago	2.398c.
One year ago	2.362c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High		Low	
1929	2.412c.,	April 2:	2.384c.,	Sept. 24
1928	2.391c.,	Dec. 11:	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4:	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5:	2.403c.,	May 18
1925	2.560c.,	Jan. 6:	2.396c.,	Aug. 18

Pig Iron

Oct. 1, 1929, \$18.29 a Gross Ton

One week ago	\$18.29
One month ago	18.25
One year ago	17.84
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1929	\$18.71,	May 14:	\$18.25,	Aug. 27
1928	18.59,	Nov. 27:	17.04,	July 24
1927	19.71,	Jan. 4:	17.54,	Nov. 1
1926	21.54,	Jan. 5:	19.46,	July 13
1925	22.50,	Jan. 13:	18.96,	July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.90c. to 1.95c.
F.o.b. Chicago.....	2.05c.
Del'd Philadelphia.....	2.22c. to 2.27c.
Del'd New York.....	2.24c. to 2.29c.
Del'd Cleveland.....	1.92 ¹ / ₂ c. to 1.95c.
F.o.b. Cleveland.....	1.90c. to 1.95c.
F.o.b. Lackawanna.....	2.05c.
F.o.b. Birmingham.....	2.10c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.....	2.05c.
F.o.b. Pittsburgh mills, cut lengths.....	2.30c.
F.o.b. Birmingham, mill lengths.....	2.10c.

Rail Steel

F.o.b. mills, east of Chicago dist., 1.85c. to 1.90c.	
F.o.b. Chicago Heights mill.....	1.95c.
Del'd Philadelphia.....	2.27c.

Iron

Common iron, f.o.b. Chicago.....	2.05c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.95c.
F.o.b. Chicago.....	2.05c.
F.o.b. Birmingham.....	2.10c.
Del'd Cleveland.....	2.14c.
Del'd Philadelphia.....	2.15c.
F.o.b. Coatesville.....	2.05c.
F.o.b. Sparrows Point.....	2.05c.
F.o.b. Lackawanna.....	2.05c.
Del'd New York.....	2.22 ¹ / ₂ c.
C.i.f. Pacific ports.....	2.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.90c. to 1.95c.
F.o.b. Chicago.....	2.05c.
F.o.b. Birmingham.....	2.10c.
F.o.b. Lackawanna.....	2.05c.
F.o.b. Bethlehem.....	2.05c.
Del'd Cleveland.....	2.14c.
Del'd Philadelphia.....	1.96c. to 2.06c.
Del'd New York.....	2.14 ¹ / ₂ c. to 2.19 ¹ / ₂ c.
C.i.f. Pacific ports.....	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh.....	2.00c.
Wider than 6 in., P'gh.....	1.90c.
6 in. and narrower, Chicago.....	2.20c.
Wider than 6 in., Chicago.....	2.10c.
Cooperage stock, P'gh.....	2.20c.
Cooperage stock, Chicago.....	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.30c.
Bars, f.o.b. Chicago.....	2.30c.
Bars, Cleveland.....	2.30c.
Bars, Buffalo.....	2.30c.
Shafting, ground, f.o.b. mill.....	2.65c. to 3.60c.
Strips, P'gh.....	2.75c. to 2.85c.
Strips, Cleveland.....	2.75c. to 2.85c.
Strips, del'd Chicago.....	3.05c. to 3.15c.
Strips, Worcester.....	2.90c. to 3.00c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland.....	4.25c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails.....	\$2.45 to \$2.55
Galvanized nails.....	4.45 to 4.55
Galvanized staples.....	3.15 to 3.25
Polished staples.....	2.90c. to 3.00c.
Cement coated nails.....	\$2.45 to \$2.55

Base per 100 Lb.

Bright plain wire, No. 6 to No. 9 gage.....	\$2.40 to \$2.50
Annexed fence wire.....	2.55 to 2.65
Spring wire.....	3.50 to 3.60
Galv'd wire, No. 9.....	3.00 to 3.10
Barbed wire, galv'd.....	3.10 to 3.20
Barbed wire, painted.....	2.85 to 2.95
Woven wire fence (per net ton to retailers).....	65.00
Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass. (wire), mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.	

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.....	\$2.70
Less carloads, Wheeling or Reading.....	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh.....	2.10c. to 2.20c.
No. 10, blue annealed, f.o.b. Chicago dist.....	2.30c.
No. 10, blue annealed, del'd Phila.....	2.42c. to 2.52c.
No. 10, blue annealed, B'ham.....	2.35c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh.....	2.25c. to 2.35c.
No. 13, f.o.b. Chicago dist.....	2.45c.
No. 13, del'd Philadelphia.....	2.67c.
No. 13, blue annealed, B'ham.....	2.50c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.75c. to 2.85c.
No. 24, f.o.b. Chicago dist. mill.....	2.95c. to 3.00c.
No. 24, del'd Philadelphia.....	3.07c. to 3.17c.
No. 24, f.o.b. Birmingham.....	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh.....	4.10c. to 4.20c.
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Galvanized

No. 24, f.o.b. Pittsburgh.....	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill.....	3.60c. to 3.70c.
No. 24, del'd Cleveland.....	3.59c. to 3.69c.
No. 24, del'd Philadelphia.....	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham.....	3.70c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill.....	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.00c. to 4.10c.
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Long Terns

No. 24, 8-lb. coating, f.o.b. mill.....	4.00c. to 4.10c.
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Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh.....	3.90c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.35
Standard cokes, f.o.b. Gary.....	5.45

Terne Plate

	(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)	
8-lb. coating I.C. \$11.20	25-lb. coating I.C. \$16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

Alloy Steel Bars

	Alloy Quality	Bar Base, 2.65c. to 2.75c. per Lb.
S.A.E. Series		
Numbers		
2000 (1 ¹ / ₂ % Nickel).....		\$0.25
2100 (1 ¹ / ₂ % Nickel).....		0.55
2300 (3 ¹ / ₄ % Nickel).....		1.50
2500 (5% Nickel).....		2.25
3100 Nickel Chromium.....		0.55
3200 Nickel Chromium.....		1.35
3300 Nickel Chromium.....		3.80
3400 Nickel Chromium.....		3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....		0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....		0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....		1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....		0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....		0.45
5100 Chromium Spring Steel.....		0.20
6100 Chromium Vanadium Bars.....		1.20
6100 Chromium Vanadium Spring Steel.....		0.95
9250 Silicon Manganese Spring Steel (flats).....		0.25
Rounds and squares.....		0.50
Chromium Nickel Vanadium.....		1.50
Carbon Vanadium.....		0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ³/₄c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2¹/₂ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ³ / ₈ in. and larger.....	\$2.80
Spikes, ¹ / ₂ in. and smaller.....	2.80
Spikes, boat and barge.....	3.00
Tie plate, steel.....	2.15

Angle bars.....	\$2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			Iron		
Inches	Steel	Galv.	Inches	Black	Galv.
1 ¹ / ₂	45	19 ¹ / ₂	1 ¹ / ₂ and 1 ³ / ₄	+11	+36
1 ³ / ₄ to 2.....	51	25 ¹ / ₂	2 ¹ / ₂	23	5
2 ¹ / ₂	56	42 ¹ / ₂	3 ¹ / ₄	28	11
3 ¹ / ₄	60	48 ¹ / ₂	1 and 1 ¹ / ₄	31	15
1 to 3.....	62	50 ¹ / ₂	1 ¹ / ₂ and 2.....	35	18
Lap Weld					
2.....	55	43 ¹ / ₂	2.....	23	9
2 ¹ / ₂ to 6.....	59	47 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₄	28	13
7 and 8.....	56	43 ¹ / ₂	4 to 6.....	30	17
9 and 10.....	54	42 ¹ / ₂	7 and 8.....	29	16
11 and 12.....	53	40 ¹ / ₂	9 to 12.....	26	11
Butt Weld, extra strong, plain ends					
1 ¹ / ₂	41	24 ¹ / ₂	1 ¹ / ₂ and 1 ³ / ₄	+13	+48
1 ³ / ₄ to 2.....	47	30 ¹ / ₂	2 ¹ / ₂	23	7
2 ¹ / ₂	53	42 ¹ / ₂	3 ¹ / ₄	28	12
3 ¹ / ₄	58	47 ¹ / ₂	1 to 2.....	34	18
1 to 1 ¹ / ₂	60	49 ¹ / ₂			
2 to 3.....	61	50 ¹ / ₂			
Lap Weld, extra strong, plain ends					
2.....	53	42 ¹ / ₂	1 ¹ / ₂	29	13
2 ¹ / ₂ to 4.....	57	46 ¹ / ₂	2 ¹ / ₂ to 4.....	34	20
4 ¹ / ₂ to 6.....	56	45 ¹ / ₂	4 ¹ / ₂ to 6.....	33	19
7 to 8.....	52	39 ¹ / ₂	7 and 8.....	31	17
9 and 10.....	45	32 ¹ / ₂	9 to 12.....	21	8
11 and 12.....	44	31 ¹ / ₂			

On carloads the above discounts on steel pipe are increased on block by one point, with supplementary discount of 5%, and on galvanized by 1¹/₂ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2¹/₂%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2¹/₂ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2 ¹ / ₄ in.....	38	1 ¹ / ₂ in.....	1
2 ¹ / ₂ in.—2 ³ / ₄ in.....	46	1 ³ / ₄ in.....	8
3 in.....	52	2 in.—2 ¹ / ₄ in.....	13
3 ¹ / ₄ in.—3 ³ / ₄ in.....	54	2 ¹ / ₂ in.—2 ³ / ₄ in.....	16
4 in.....	57	3 in.....	17
4 ¹ / ₂ in. to 6 in.....	46	3 ¹ / ₄ in. to 3 ³ / ₄ in.....	18
		4 in.....	20
		4 ¹ / ₂ in.....	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts: Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
1 in.....	61	3 in.....	46
1 ¹ / ₄ to 1 ¹ / ₂ in.....	53	3 ¹ / ₄ to 3 ³ / ₄ in.....	48
1 ³ / ₄ in.....	37	4 in.....	51
2 to 2 ¹ / ₄ in.....	32	4 ¹ / ₂ , 5 and 6 in.....	40
2 ¹ / ₂ to 2 ³ / ₄ in.....	40		

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads).....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

are probably not more than five points under this figure.

Wire Products.—Business in wire and wire nails is very slow, and is not helped by a very unsatisfactory price situation so far as jobbers' business is concerned. Wire nails are still quotable at \$2.45 to \$2.55 per keg, Pittsburgh, although the price at Chicago is weaker by at least \$1 a ton. Ordinarily the market at Chicago is \$1 higher than Pittsburgh. Jobbers' wire products have reflected the weakness in nail prices, and the 2.40c. Pittsburgh price is being shaded on some business. On manufacturers' wire, this is the minimum of Pittsburgh district mills.

Tubular Goods.—Pipe mills in this and nearby districts continue fairly busy, with the operating rate of the industry as a whole at 70 to 75 per cent of theoretical capacity. Seamless mills are the most active, while the butt weld units are not so well engaged. Business in lap weld tubing is of a hand-to-mouth character as mills do not have heavy backlogs, but orders placed from day to day seem to be sufficient to justify a good operating rate. Mechanical tubing is still rather dull on account of the reduced operations of the automobile industry, but signs of improvement are reported from some sources. There is a good movement of boiler tubes. Prices on lapwelded steel and standard commercial seamless boiler tubes have been advanced \$4 a ton by leading makers, the advance effecting a two-point reduction of all base discounts f.o.b. Pittsburgh. No change has been made in the price of charcoal iron boiler tubes.

Tin Plate.—Mill operations are holding up remarkably well, with the leading producer running at 85 to 90 per cent of capacity and the independents ranging down to 70 or 75 per cent. The latter have not yet begun working on anticipated tonnage

for next year, while such business is contributing to the well sustained operating rate of the largest maker. September shipments were high for that month, and the end of October will likely see a gradual improvement. However, little 1930 business is placed until the next year's price is announced, usually in the first half of November.

Strip Steel.—Business is spotty. Incoming tonnage is just about sufficient for a 70 to 75 per cent operation in the industry as a whole. In some cases, the cold mills have a better engagement while the reverse is true with other makers. Slightly heavier releases from some of the automobile companies are giving the market a somewhat more optimistic turn, although few makers expect a very large increase from this source in the fall months. Occasional price shading is reported, but the market is not quotably lower on either hot-rolled or cold-rolled material. In a few cases makers of welded tubing are reported to have renewed old contracts for cold-rolled strip, carrying a price under 2.75c., Pittsburgh or Cleveland, but this figure still represents the market. Instances of shading the hot-rolled strip prices of 1.90c. and 2c., Pittsburgh, are still rather uncommon and difficult to confirm.

Cold-Finished Steel Bars.—Reduction of the Cleveland base price on cold-finished steel bars to 2.30c. to meet the quotation of the new producer at Buffalo was not unexpected and places the market on the same price footing at all four of the basing points. Pittsburgh mills will meet outside competition in some cases, but the new basing point at Buffalo will not affect the price for many large users. The market is quiet, but demand was maintained at a rather steady rate during September and some improvement is looked for this month. Users in this territory have generally covered their third quarter needs at 2.30c., Pittsburgh.

Coke.—The coke market is still dull and prices have not gained strength on either the furnace or foundry grade. The former is still quotable at \$2.65 to \$2.75, Connellsville, on spot business, while contract tonnage is not bringing much above the top of this range. Shipments of foundry coke are expected to improve this month and domestic coke will begin to move more freely with the coming of cold weather. The premium grades of foundry coke are holding at \$4.85 a net ton, ovens.

Old Material.—The scrap market is still in a very unsettled condition, and, with mill purchases delayed for at least another week, the principal grades are quotable at 25c. a ton less than they were a week ago. This places No. 1 heavy melting steel at \$17.50 to \$18 and compressed sheets at 25c. less. Specialties are also weaker, and heavy steel axle turnings are off 50c. a ton. Short shoveling steel turnings have declined, as pur-

chases are being made to cover a recent order at \$13. Dealers' buying prices on heavy melting steel range as low as \$17, although such sales usually represent distress tonnages. One large consumer in the district is reported to be considering the purchase of scrap in the near future, but other mills seem well supplied, and there are still hold-ups at a number of points. The monthly list of the Pennsylvania Railroad, which closes on Oct. 2, is expected to throw some light on the price situation, as recent quotations have been largely nominal. This list contains 55,000 tons, including 9000 tons of heavy melting steel and 11,000 tons of rails. The Baltimore & Ohio list, which closes Oct. 7, contains 23,000 tons, including 5000 tons of heavy melting.

Prices per gross ton delivered consumers yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel.	\$17.50 to \$18.00
No. 2 heavy melting steel.	15.50 to 16.00
Scrap rails	16.50 to 17.00
Compressed sheet steel.	17.25 to 17.75
Bundled sheets, sides and ends	16.00 to 16.50
Cast iron carwheels	16.00 to 16.50
Sheet bar crops, ordinary	19.00 to 19.50
Heavy breakable cast	12.00 to 12.50
No. 2 railroad wrought	17.50 to 18.00
Hvy. steel axle turnings	16.00 to 16.50
Machine shop turnings	11.50 to 12.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	20.50 to 21.00
Railr. coil and leaf springs	20.50 to 21.00
Roller steel wheels	20.50 to 21.00
Low phos. billet and bloom ends	21.50 to 22.00
Low phos., mill plates	21.50 to 22.00
Low phos., light grades	20.50 to 21.50
Low phos., sheet bar crops	21.50 to 22.00
Heavy steel axle turnings	16.00 to 16.50
Electric Furnace Grades:	
Low phos., punchings	19.50 to 20.50
Hvy. steel axle turnings	16.00 to 16.50
Blast Furnace Grades:	
Short shoveling steel turnings	12.00 to 12.50
Short mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	19.00 to 20.00

Ship Construction Loans Call for Seven Vessels

WASHINGTON, Oct. 1.—The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., will build two 20-knot combination passenger and cargo turbo-electric steamers of approximately 33,000 tons displacement each for the Dollar Steamship Line, Inc., which last week was awarded loans of \$5,287,500 by the board for the construction of each vessel.

The board also has approved a loan of \$6,304,687 to be used by the Motor Tankship Corporation in the aid of constructing five motor tankers of approximately 13,450 deadweight tons each. The vessels are to be built by the Sun Shipbuilding & Dry Dock Co., Chester, Pa.

The eleventh annual convention of the Southern Metal Trades Association will be held at Knoxville, Tenn., on Oct. 16 and 17. W. E. Dunn, Jr., Healey Building, Atlanta, Ga., is secretary.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.60c.
Structural shapes	3.60c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c. to 3.90c.
Galv. sheets (No. 24), 25 or more bundles	4.45c. to 4.55c.
Light plates, blue annealed (No. 10), 1 to 24 plates	3.35c. to 3.45c.
Blue annealed sheets (No. 13), 1 to 24 sheets	3.50c. to 3.60c.
Galv. corrug. sheets (No. 28), per square	\$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count	60 per cent off list
Machine bolts, 100 count	60 per cent off list
Carriage bolts, 100 count	60 per cent off list
Nuts, all styles, 100 count	60 per cent off list
Large rivets, base per 100 lb.	\$3.50
Wire, black soft, ann'd, base per 100 lb.	\$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	2.90 to 3.00
Cement coated nails, per keg	3.05

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms		Sheet Bars		Skelp	
	Per Gross Ton	(Open Hearth or Bessemer)	Per Gross Ton	(F.o.b. Pittsburgh or Youngstown)	Per Lb.
Rerolling, 4-in. and under 10 in., Pittsburgh	\$35.00	Pittsburgh	\$35.00	Grooved	1.85c. to 1.90c.
Rerolling, 4-in. and under 10 in., Youngstown	35.00	Youngstown	35.00	Universal	1.85c. to 1.90c.
Rerolling, 4-in. and under 10 in., Cleveland	35.00	Cleveland	35.00	Sheared	1.85c. to 1.90c.
Rerolling, 4-in. and under 10 in., Chicago	37.00				
Forging quality, Pittsburgh	\$40.00 to 41.00				

Prices of Raw Material

Ores		Ferromanganese		Fluxes and Refractories	
Lake Superior Ores, Delivered Lower Lake Ports		Per Gross Ton		Fluorspar	
	Per Gross Ton				Per Net Ton
Old range Bessemer, 51.50% iron	\$4.80	Domestic, 80%, seaboard	\$105.00	Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$18.00
Old range non-Bessemer, 51.50% iron	4.65	Foreign, 80%, Atlantic or Gulf port, duty paid	105.00	No. 2 lump, Illinois and Kentucky mines	20.00
Mesabi Bessemer, 51.50% iron	4.65			Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	\$18.25 to \$18.75
Mesabi non-Bessemer, 51.50% iron	4.50			Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines	\$2.50
High phosphorus, 51.50% iron	4.40				
Foreign Ore, c.i.f. Philadelphia or Baltimore					
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	\$12.00c.				
Iron ore, low phos., Swedish, average 68% iron	12.00c.				
Iron ore, basic Swedish, average 65% iron	10.00c.				
Manganese ore, washed, 52% manganese, from the Caucasus	30.00c.				
Manganese ore, Brazilian, African or Indian, basic 50%	30.00c.				
Tungsten ore, high grade, per unit, in 60% concentrates	\$16.25 to \$16.50				
Chrome ore, 45 to 50% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00				
Molybdenum ore, 85% concentrates of MoS ₃ , delivered	50c. to 55c.				
Coke		Electric Ferrosilicon		Fire Clay Brick	
	Per Net Ton				Per 1000 f.o.b. Works
Furnace, f.o.b. Connellsville prompt	\$2.65 to \$2.75				
Foundry, f.o.b. Connellsville prompt	3.75 to 4.75				
Foundry, by-product, Ch'go ovens	8.00				
Foundry, by-product, New England, del'd	11.00				
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40				
Foundry, by-product, Phila.	9.00				
Foundry, Birmingham	5.00				
Foundry, by-product, St. Louis, f.o.b. ovens	8.00				
Foundry by-prod., del'd St. Louis	9.00				
Coal		Bessemer Ferrosilicon		Silica Brick	
	Per Net Ton				Per 1000 f.o.b. Works
Mine run steam coal, f.o.b. W. Pa. mines	\$1.25 to \$1.75				
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75				
Gas coal, 3/4-in. f.o.b. Pa. mines	1.90 to 2.00				
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75				
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.				
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10				

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts		Bolts and Nuts		Small Rivets	
	Per 100 Pieces		Per Cent Off List	(3/8-In. and Smaller)	Per Cent Off List
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)		Semi-finished hexagons nuts	70	F.o.b. Pittsburgh	70 and 10
		Semi-finished hexagons castellated nuts, S.A.E.	70	F.o.b. Cleveland	70 and 10
		Stove bolts in packages, P'gh	75, 20, 10 and 5	F.o.b. Chicago	70 and 10
		Stove bolts in packages, Chicago	75, 20, 10 and 5		
		Stove bolts in packages, Cleveland	75, 20, 10 and 5		
		Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2 1/2		
		Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2 1/2		
		Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2 1/2		
		Tire bolts	60, 5 and 5		
		Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.			
Cap and Set Screws		Large Rivets		Cap and Set Screws	
	Per Cent Off List		Base per 100 Lbs.		Per Cent Off List
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)		(1/2-In. and Larger)		Milled cap screws	80, 10 and 5
				Milled standard set screws, case hardened	80 and 5
				Milled headless set screws, cut thread	75 and 10
				Upset hex. head cap screws, U.S.S. thread	85
				Upset hex. cap screws, S.A.E. thread	85
				Upset set screws	80, 10 and 5
				Milled studs	70

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

Chicago

Outside Mills Offering Bars, Plates and Shapes at Concessions—Rail Inquiry Totals Over 500,000 Tons

CHICAGO, Oct. 1.—Sales of finished steel products, though the best in seven weeks, are still short of shipments and the indications are that further revision downward in the rate of ingot production is near at hand. Specifications are the largest in five weeks, but releases are for the most part at close range, as the future is viewed with less certainty by most consumers. Fresh inquiry is brisk, the aggregate tonnage being the largest for any week, with three exceptions, since the first of the year.

Eager desire to place tonnages as the fourth quarter opens is lacking, especially as prices show less certainty than a week ago. Local producers are asking 2.05c. a lb. for plates, shapes and bars. These products from other producing centers are being offered to a wider circle of buyers at 2c., Chicago.

The rail market continues to hold a prominent place, with inquiry well over the 500,000-ton mark.

The Santa Fe has ordered 87,200 tons, of which 74,860 tons was taken by the Colorado Fuel & Iron Co. and 6170 tons each by the Inland Steel Co. and the Illinois Steel Co. Railroad equipment orders include 2000 hopper cars by the Norfolk & Western and 500 gondola bodies by the Chicago & Eastern Illinois. An oil tanker requiring 5000 tons of steel has been ordered from a Lake Michigan shipbuilder by the Standard Oil Co.

Pig Iron.—Shipments of Northern pig iron from local furnaces in the first nine months of the year established a record. Releases remain heavy at the full rate of output of the five merchant stacks that now are in blast. Iroquois No. 5 will be lighted in a few days, and with this furnace in it will again be possible for local producers to amplify stocks. Forward buying is moving steadily and it is now disclosed that a few purchasers have placed their needs through the first quarter of next year. A melter near Chicago has taken 5000 tons of Southern iron at a price which figures between \$13 and \$13.50 a ton, Birmingham. Interest in low phosphorus iron is increasing as supplies of English iron brought to Lake Michigan ports early in the year near exhaustion. An order for 700 tons of 10 per cent silvery has been taken at \$27 a ton, Jackson County, Ohio, furnace. Prices for this commodity show no tendency to gain strength. Occasional concessions on charcoal iron are still to be found in this market.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25..	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75..	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail) ..	\$19.01 to 19.51
Low phos., sil. 1 to 2, copper free..	29.50
Silvery, sil. 8 per cent.	29.79
Bess. ferrosilicon, 14-15 per cent...	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—This market is active only in less than carload lots. For business of this character prices are holding.

Prices delivered Chicago: 80 per cent ferromanganese, \$112.56; 50 per cent ferrosilicon, \$83.50 to \$88.50; spiegelisen, 19 to 21 per cent, \$39.76 to \$41.76.

Sheets.—The Chicago sheet market remains active, with output fully sustained at 90 per cent of capacity. New buying, the bulk of which is for nearby needs, is almost equal to shipments and backlogs have changed little in the week. Pressure for deliveries on the heavy gage blue annealed product is easier, and promises are now being made in six to seven weeks. Other grades range from three to four weeks, while roofing sheets are obtainable in two to three weeks. The price situation is still tangled, especially to the south of Chicago. Manufacturers of farm machinery are now entering specifications for the next three months, and, if their estimates of requirements hold true, they will take in the final quarter a larger tonnage of sheets than in the corresponding period a year ago.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3c. to 3.05c.; No. 24 galv., 3.65c. to 3.75c.; No. 10 blue ann'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Rails and Track Supplies.—The rail orders placed by the Chesapeake & Ohio, Pere Marquette and Hocking Valley totaled 79,257 tons. Of this amount, the Chesapeake & Ohio will take 53,480 tons, the Pere Marquette 20,300 tons and the Hocking Valley 5477 tons. The Chesapeake & Ohio awarded 16,273 tons to the Bethlehem Steel Corporation, 10,047 tons to the Inland Steel Co., 18,604 tons to the Illinois Steel Co. and 8556 tons to the Carnegie Steel Co. The Pere Marquette placed 7920 tons with the Illinois Steel Co., 9953 tons with Inland Steel, 1727 tons with Bethlehem and 700 tons with the Algoma Steel Corporation. The entire tonnage for the Hocking Valley went to the Illinois Steel Co. Reports elsewhere last week that the Missouri Pacific had ordered about 40,000 tons of rails were not correct. This railroad has not yet sent out an inquiry. The Pennsylvania is asking for 200,000 tons of rails and will take an option on an additional 110,000 tons. This total of 310,000 tons compares with 272,000 tons the Pennsylvania took last year. The New York Central's inquiry is for 200,000 tons and may be enlarged by 14,000 tons for new

construction work. Local mills are still making deliveries against the 1929 purchase of the Illinois Central, and therefore sellers do not expect that this road will enter the market until nearly the end of the present buying movement. The Santa Fe has ordered 87,200 tons of rails, the distribution of which is given in one of the leading paragraphs of this report. The Monon has ordered 4500 tons of rails from the Illinois Steel Co. Inquiry for track supplies is impressive. The light rail market is without feature.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Cast Iron Pipe.—Bids opened this week at Milwaukee show that 200 tons of 6-in. pipe was taken by R. D. Wood & Co. at \$43.90 a ton, delivered, and 300 tons of 12-in. pipe was taken by the United States Pipe & Foundry Co. at \$45.50 a ton, delivered. The freight rate from Birmingham to Milwaukee is \$8.50. Sidney, Ohio, has awarded 15,000 ft. of 6 and 8-in. pipe to an unnamed bidder, and the McWane Cast Iron Pipe Co. has taken 100 tons of 2 to 6-in. for Kempton, Ill., and 200 tons of 4 to 8-in. pipe for Carmel, Ind. It is reported that the United States company is low bidder on 200 tons of pipe at Bridgman, Mich. This market remains moderately active in small tonnages, on which prices are easier.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$43.70 to \$45.70; 4-in., \$47.70 to \$49.70; Class A and gas pipe, \$3 extra.

Plates.—The Pacific Gas & Electric Co. has placed with the Milwaukee fabricator 348 miles of pipe, which will require about 55,000 tons of plates. The Milwaukee company has also booked a 14,000-ton order for 20-in. pipe for California. It is understood that these orders are for immediate fabrication, and local plate mill schedules are being helped out by releases of steel by this fabricator whose output was curtailed several weeks ago when a contract for line pipe was temporarily suspended. It is reported here that a 100,000-ton line pipe project is under consideration for the delivery of gas from Texas fields to the Central West. Shops which recently took car orders for the St. Paul have placed this week the needed 12,000 tons of steel. Tank steel orders total 5700 tons, and fresh inquiry is for 3000 tons. A Chicago shop will fabricate 3000 tons of plates for tanks to be erected in Texas and 1200 tons will be fabricated in Oklahoma.

Reinforcing Bars.—New inquiries before the trade indicate a more active market, but sales are sluggish notwithstanding the pressure brought to bear by the possibility of higher asking prices. In the past, like gestures by sellers have driven in numerous contracts. At present, however, buyers are handicapped in the matter of arranging loans for new construction purposes. Many plans have been

prepared by architects and in general purchases appear willing to come into the market as soon as funds are available. A small tonnage of Cook County, Ill., highway work is in early prospect. The lateness of the season may delay until spring extensive road building plans by the State.

Structural Material.—Business in prospect is enlarged this week by the announcement that the Marshall Field Estate will erect a 42-story office structure in Chicago. Preliminary estimates place the steel needed at 20,000 tons. Awards for the week, including 2300 tons for a Chicago public school building, total 4400 tons. Fresh inquiry amounts to 6300 tons, not including the Marshall Field Estate Building.

Mill prices on plain material, per lb.: 2.05c. base, Chicago.

Wire Products.—Little change has occurred in this market in the last week. Forward contracting has gained some headway, but spot orders, especially from the jobbing trade, are unusually light for this time of the year. Prices continue to lean to the weak side, especially when deliveries are to the south and south-east of Chicago.

Old Material.—Consumers of heavy melting have bought a total of 20,000 tons, following fairly large purchases of a week or so ago. Brokers are busily covering recent sales. Declines in prices in recent weeks have made buyers of all grades of scrap more cautious and, as a result, open inquiry has almost wholly disappeared from the market. However, shipments of most grades continue to go forward in good volume. Scrap iron and steel coming on track is a little in excess of melters' requirements, and this fact is tending to depress prices. Dealers find the needs of gray iron foundries more spotty than in September. On the whole, there is small change in the rate of melt by foundries, though their order books are growing lighter. Agreement among dealers as to definite specifications for hydraulic bundles prepared by them is leading buyers again to consider the use of this grade. Though

offers of this grade have been made, no sales are reported. Dealers are finding a free supply of heavy melting steel at \$15 a gross ton, delivered. Though prices are weak, brokers do not look for a serious break. The closing of two lists, one by the Chicago & North Western and one by the Burlington, have been postponed until late this week. New lists are being offered by the Pennsylvania, New York Central, Michigan Central, Big Four and various units of General Motors Corporation.

Prices deliv'd Chicago district consumers: Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$14.50 to \$15.00
Shoveling steel.....	14.50 to 15.00
Frogs, switches and guards, cut apart, and misc. rails	16.25 to 16.75
Hydraulic compressed sheets	13.00 to 13.50
Drop forge flashings.....	10.75 to 11.25
No. 1 busheling.....	12.75 to 13.25
Forg'd cast and r'l'd steel carwheels.....	18.75 to 19.25
Railroad tires, charg. box size.....	18.75 to 19.25
Railroad leaf springs cut apart.....	18.75 to 19.25

Acid Open-Hearth Grades:	
Steel couplers and knuckles	17.00 to 17.50
Coil springs.....	19.00 to 19.50

Electric Furnace Grades:	
Axle turnings.....	14.25 to 14.75
Low phos. punchings.....	17.00 to 17.50
Low phos. plates, 12 in. and under.....	17.00 to 17.50

Blast Furnace Grades:	
Axle turnings.....	12.00 to 12.50
Cast iron borings.....	10.50 to 11.00
Short shoveling turnings.....	10.50 to 11.00
Machine shop turnings.....	7.50 to 8.00

Rolling Mill Grades:	
Iron rails.....	16.00 to 16.50
Rerolling rails.....	17.50 to 18.00

Cupola Grades:	
Steel rails less than 3 ft.....	17.50 to 18.50
Steel rails less than 2 ft.....	20.00 to 20.50
Angle bars, steel.....	17.00 to 17.50
Cast iron carwheels.....	14.00 to 14.50

Malleable Grades:	
Railroad.....	17.00 to 17.50
Agricultural.....	15.50 to 16.00

Miscellaneous:	
*Relaying rails, 56 to 60 lb.....	23.00 to 25.00
*Relaying rails, 65 lb. and heav.....	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms.....	21.00 to 21.50
Iron car axles.....	26.00 to 26.50
Steel car axles.....	17.50 to 18.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	13.00 to 13.50
No. 1 busheling.....	9.00 to 9.50
No. 2 busheling.....	7.00 to 7.50
Locomotive tires, smooth.....	14.50 to 15.00
Pipes and flues.....	10.00 to 10.50

Cupola Grades:	
No. 1 machinery cast.....	14.50 to 15.00
No. 1 railroad cast.....	14.00 to 14.50
No. 1 agricultural cast.....	13.25 to 13.75
Stove plates.....	12.25 to 12.75
Grate bars.....	11.75 to 12.25
Brake shoes.....	11.50 to 12.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Bars.—Fresh inquiry for mild steel bars is unusually heavy. New buying is dragging, though it is somewhat heavier than a week ago. The price situation in this market has changed only in a slight widening of the circle of preferred buyers. Forward contracting is going forward on the basis of 2.05c. a lb., Chicago. Forge shops in this area are laying plans for November output, and, as schedules now stand, the consumption of bars in that month will show some improvement over the current rate. Consumption of bars by builders of farm machinery is on the upturn. Railroad needs of iron bars for the fourth quarter are normal, as gaged

by contracts already signed. Prices are steady at 2.05c. a lb., Chicago. The alloy bar market is steady in sales and shipments, and output remains at 70 per cent of capacity. Forward contracting in rail steel bars is gaining headway, though many users still prefer to buy at close range. Mills are having considerable trouble in trying to meet the exacting deliveries expected by buyers.

Bolts, Nuts and Rivets.—Total specifications for these products in the third quarter fell measurably short of the tonnages taken out in the first and second quarters. September started poorly, but in recent days releases have been growing and shipping schedules for October give promise of further improvement. Much of the betterment comes from farm implement manufacturers, who are going into production on tractors for export and who are entering into production on new lines of machinery which are taken by the trade in the spring and summer months.

Coke.—By-product foundry coke demand is steady and prices are firm at \$8 a ton, local furnace.

Railroads Seek Reopening of Steel Rate Case

WASHINGTON, Oct. 1.—Railroads in Official Classification territory today filed a petition with the Interstate Commerce Commission asking for reopening of the Eastern general steel rate case. Reconsideration is specifically sought regarding five of the findings in the commission's decision, the effective date of which recently was postponed to Dec. 20 from Oct. 20 at the suggestion of the carriers.

The railroads claim that the scales prescribed would reduce their revenues in Official Classification territory by at least \$2,500,000 annually and that other losses would result.

Sheet Mill Plant Expansion

Central Alloy Steel Corporation has authorized an expenditure of over \$600,000 for improvements to its plants at Massillon and Canton, Ohio. The entire sheet rolling mill plant at Massillon will be equipped with continuous pack and pair furnaces and electric driving equipment will be installed. A new continuous furnace was recently constructed and similar equipment for the remaining four mills will be added. These improvements are expected to result in 40 per cent greater output of automobile body sheets. A normalizing furnace designed by the company's engineering and metallurgical departments will be installed at Canton. This will be 100 ft. long and 9 ft. wide.

Industrial Steel Treating Co., manufacturer of industrial furnaces and heat treating equipment, has removed to Sixth and Fallon Streets, Oakland, Cal.

Warehouse Prices, f.o.b. Chicago

Base per Lb.	
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforc'g bars, billet steel.....	2.10c. to 2.35c.
Reinforc'g bars, rail steel.....	1.85c. to 2.00c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands (3/4 in. in Nos. 10 and 12 gages).....	3.20c.
Hoops (No. 14 gage and lighter).....	3.75c.
Black sheets (No. 24).....	4.05c.
Galv. sheets (No. 24).....	4.90c.
Blue ann'l'd sheets (No. 10).....	3.35c.
Spikes, 3/4 in. and larger.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	4.00c.
Rivets, boiler.....	4.00c.
Per Cent Off List	
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, sq. tap. or blank.....	60
Hot-pressed nuts, hex. tap. or blank.....	60
No. 8 black ann'l'd wire, per 100 lb.....	\$3.45
Com. wire nails, base per keg.....	3.20
Cement c'd nails, base per keg.....	3.20

New York

New York Central Inquires for 200,000 Tons of Rails—Bank Building Takes 15,000 Tons of Steel

NEW YORK, Oct. 1.—Pig iron sales for the week totaled 10,000 tons, of which about one-quarter was for shipment from Alabama. Prices on Southern iron are steadily growing firmer, with sellers holding to a minimum of \$13.50, base Birmingham, on foundry grade. It is conceded that as low as \$13 might still be quoted on attractive tonnages of stock iron of low silicon content. Most melters in this territory have covered for at least a substantial part of their fourth quarter requirements and their is no inclination to place any further tonnage for first quarter. A quieter market, therefore, seems to be in immediate prospect. Shipments, however, are going forward with virtually no interruption, and foundry melt is rather well sustained, being largely unaffected by the decline in automobile manufacture. Prices on eastern Pennsylvania foundry iron range from \$18.50 to \$19, base furnace, and on Buffalo foundry grade from \$17.50 to \$18, base furnace. Barge shipments from Buffalo, which have been heavy in the past six weeks, may decline in view of an impending increase in the grain movement and the possibility of higher rates. The Port Henry, N. Y., furnace, which has been out for repairs, is expected to be blown in by Oct. 15. The Worthington Pump & Machinery Corporation is in the market for 1600 tons of various grades for its Harrison, N. J., Holyoke, Mass., and Elmwood Place, Ohio, plants. The New York Central Railroad is inquiring for 350 tons for delivery to Frankfort, N. Y., or Elkhart, Ind.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25.....	\$22.41 to \$22.91
*Buf. No. 2, del'd east. N. J.	20.78 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	19.89 to 21.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	20.39 to 21.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

Cast Iron Pipe.—Quotations are still irregular, but Northern foundries are maintaining prices at a slightly higher level than for some weeks, quoting from \$32 to \$34 a ton, foundry, on most of the current business. Buying is limited to lots of a carload to a few hundred tons. Providence, R. I., has awarded 200 tons of 12-in. water pipe to the United States Pipe & Foundry Co. Municipalities are planning additions to their water supply, which should provide some fair tonnages of pipe for spring delivery. Authorization of bond issues or appropriations for water supply expansion have recently been made by Briarcliff Manor, N. Y., North Caldwell, N. J., and Danbury, Conn. Among recent private purchases of cast iron

pipe is an order for about 400 tons placed by the American Construction & Securities Co. with a Southern maker for export to Cuba.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, \$34.60 to \$36.60; 4-in. and 5-in., \$37.60 to \$39.60; 3-in., \$41.60 to \$46.60. Class A and gas pipe, \$3 extra.

Reinforcing Bars.—The volume of orders has dropped off somewhat and inquiries also are less numerous. Prices are holding fairly well, although in a few cases foreign steel has been sold at less than the current market.

Billet steel reinforcing bars in 40, 50 and 60-ft. lengths, 2.05c. per lb., Pittsburgh, and 2.30c. per lb., Pittsburgh warehouse, for cut lengths. Out of New York warehouse, 2.90c. per lb. for lots of 5 tons or more, 3.05c. for lots of 2 to 5 tons and 3.30c. for less than 2 tons, all delivered at job.

Finished Steel.—Although steel bookings by local offices during September were generally larger than those of August and larger also than September orders last year, the steel situation lacks the snap to which the trade had grown accustomed during the earlier months of the year. Fourth quarter contracts for bars have generally been revised to the basis of 1.90c., Pittsburgh. Although the Pittsburgh price on shapes is also off \$1 a ton, this does not materially affect the Eastern situation, which is based on the price of material at Bethlehem, Pa., in which no change has been reported. Sheet prices, while not quotably lower, are uncertain. The open price on black sheets is 2.85c., Pittsburgh, but quotations of 2.75c. have appeared on desirable business. On galvanized sheets, 3.50c. is the usual price, as some mills which have been holding for 3.60c. have abandoned efforts to obtain above 3.50c. Light-gage blue annealed sheets are steady, but on the heavy gages quotations of 2.10c., Pittsburgh, are fairly common. The New York Central will receive bids up to Oct. 9 on 200,000 tons of steel rails for its 1930 requirements. Railroad car buying continues to be a promising prospect, but expected inquiries are slow in coming out. The Farmers Loan & Trust Building, New York, will take 15,000 tons of structural steel, which has been awarded to the McClintic-Marshall Co. Two new subway sections in New York call for a total of 17,000 tons, on which bids will be received the last week of October. In export trade, the placing of 60,000 base boxes of tin plate by the Nippon Oil Co. for shipment to Japan was outstanding. The business was divided among five makers.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.24c. to 2.29c.; plates, 2.22½c.; structural shapes, 2.19½c.; bar iron, 2.14c.

Warehouse Business.—Buying from stock was fair during September.

Black, galvanized and blue annealed sheet prices are still subject to concessions of \$1 or more a ton. Zinc sheet quotations have been advanced 25c. a 100 lb. to a range of 10.75c. to 11.25c. a lb. for No. 9 in casks.

Coke.—Demand for heating coke is increasing with the approach of cold

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes.....	3.30c.
Soft steel bars, small shapes.....	3.25c.
Iron bars.....	3.24c.
Iron bars, Swed. charcoal.....	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Cold-roll, strip, soft and quarter hard.....	5.15c. to 5.40c.
Hoops.....	4.25c.
Bands.....	3.75c.
Blue ann'd sheets (No. 10).....	3.70c. to 3.90c.
Long ternc sheets (No. 24).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galv. annealed.....	5.15c.
Tire steel, 1½ x ½ in. and larger.....	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger.....	3.75c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller.....	.60
1 x 30 in. and smaller.....	.50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller.....	.60
¾ x 20 in. and smaller.....	.50 to 50 and 10
Coach screws:	
¾ x 6 in. and smaller.....	.60
1 x 6 in. and smaller.....	.50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.....	\$17.33
Seamless steel, 2-in.....	20.24
Charcoal iron, 2-in.....	25.00
Charcoal iron, 4-in.....	67.00

Standard Steel—	Black	Galv.
¾-in. butt.....	46	29
¾-in. butt.....	51	37
1-3 in. butt.....	53	39
2½-6-in. lap.....	48	35
7 and 8-in. lap.....	44	17
11 and 12-in. lap.....	37	12

Wrought Iron—	
¾-in. butt.....	5 +19
¾-in. butt.....	11 + 9
1-1½-in. butt.....	14 + 6
2-in. lap.....	5 +14
3-6-in. lap.....	11 + 6
7-12-in. lap.....	3 +16

Tin Plate (14 x 20 in.)	Prime	Seconds
Coke, 100 lb. base box...	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC.....	\$9.70	\$12.10
IX.....	12.00	14.25
IXX.....	13.90	16.00

Ternc Plate (14 x 20 in.)	
IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass	Per Lb.
Nos. 18 to 20.....	3.75c. to 3.80c.
No. 22.....	3.90c. to 3.95c.
No. 24.....	3.95c. to 4.00c.
No. 26.....	4.05c. to 4.10c.
No. 28*.....	4.20c. to 4.25c.
No. 30.....	4.45c. to 4.50c.

Sheets, Galvanized	Per Lb.
No. 14.....	4.20c. to 4.40c.
No. 16.....	4.15c. to 4.25c.
No. 18.....	4.20c. to 4.40c.
No. 20.....	4.30c. to 4.50c.
No. 22.....	4.40c. to 4.60c.
No. 24.....	4.65c. to 4.75c.
No. 26.....	4.90c. to 5.00c.
No. 28*.....	5.15c. to 5.25c.
No. 30.....	5.55c. to 5.65c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

weather, but standard furnace grade is unchanged at \$2.65 to \$2.75 a net ton, Connellsville. Special brands of beehive foundry coke are quoted at \$4.85 a net ton, ovens, or \$8.56, delivered to northern New Jersey, Jersey City and Newark, and \$9.44 to New York and Brooklyn. By-product coke is quoted at \$9 to \$9.40 a net ton, Newark or Jersey City, and \$10.06, New York or Brooklyn.

Old Material.—Brokers filling No. 1 heavy melting steel contracts with eastern Pennsylvania mills have reduced their buying prices to \$15.50 a ton, delivered, at which price a plentiful supply is reported. Shipments are being made to Bethlehem, Steelton, Conshohocken, Pa., and Claymont, Del. No. 2 heavy melting steel is being bought at \$13.25 a ton, delivered to a Harrisburg, Pa., mill, and at \$13 a ton, delivered Phoenixville, Pa. Buying prices of steel car axles, specifica-

tion pipe and chemical borings are also off about 50c. a ton, and forge fire is about 25c. a ton lower in price.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	\$12.00 to \$12.85
Heavy melting steel (yard)	8.00 to 9.50
No. 1 hvy. breakable cast	10.25 to 11.00
Stove plate (steel works)	8.00 to 8.25
Locomotive grate bars	8.25 to 8.75
Machine shop turnings	7.75 to 8.00
Short shoveling turnings	8.00 to 8.50
Cast borings (blast furn. or steel works)	7.00 to 7.75
Mixed borings and turnings	6.75 to 7.75
Steel car axles	19.00 to 19.50
Iron car axles	23.00 to 24.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	10.25
Forge fire	9.50 to 10.00
No. 1 railroad wrought	12.00 to 12.50
No. 1 yard wrought, long	11.00 to 11.50
Rails for rolling	13.25 to 13.75
Stove plate (foundry)	8.00 to 8.50
Malleable cast (railroad)	14.00 to 14.50
Cast borings (chemical)	9.50 to 10.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	\$16.50
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	14.50
No. 2 cast (radiators, cast boilers, etc.)	14.00

furnace, for shipment in the Michigan territory.

Prices per gross ton at Cleveland:

N'th'n fdy., sil 1.75 to 2.25	\$19.50
S'th'n fdy., 1.75 to 2.25	20.00
Malleable	19.50
Ohio silvery, 8 per cent.	28.00
Basic Valley furnace	18.50
Stand. low phos., Valley	26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

Iron Ore.—Shipments of Lake Superior ore continued at a high rate through September, the movement by water during the month, with one dock estimated, having been 9,547,000 tons. Water shipments to Oct. 1 amounted to 53,264,000 tons.

Rails and Track Supplies.—Orders for rails for the Chesapeake & Ohio, Pere Marquette and Hocking Valley railroads were closed during the week, and aggregated 79,257 tons. [For distribution see rail paragraph, Chicago market report.] Negotiations are under way for track accessories to go with these rails. The Chesapeake & Ohio alone will buy 8000 tons of tie plates.

Semi-Finished Steel.—Specifications against contracts for sheet bars, billets and slabs have further declined, and the leading local producer has nearly caught up on orders. This company is still operating 13 of its 14 open-hearth furnaces. Most consumers have closed fourth quarter contracts at \$35, either Cleveland, Youngstown or Pittsburgh.

Wire rods are now commonly quoted at \$40, Cleveland, attempts to get \$42 apparently having disappeared. Some contracts are being closed for the fourth quarter.

Sheets.—As some of the mills have become more in need of orders, the market shows increasing signs of weakness on all grades but blue annealed, on which there has not been much of a market test recently. Concessions to 4c. on automobile body sheets in Detroit are reported, and it is expected that that will become the established price before the end of the week. While some of the mills report no difficulty in getting 2.85c. for black sheets, business has been taken at 2.75c. Galvanized sheets have further weakened and can be bought at 3.50c., Valley, equivalent to 3.40c., Pittsburgh. Specifications continue light.

Strip Steel.—Specifications for both hot and cold-rolled strip are light, and production has been materially reduced. Large buyers in the automotive field are not making extended future commitments because they are uncertain of their requirements during the rest of the year and apparently also because they expect to secure more favorable prices. Concessions to 1.80c. are reported on wide strip, but narrow material and bands are firm. Most cold-rolled strip mills need orders. This product is quoted at 2.75c., Cleveland, except for small lots.

Cleveland

Price Weakness Follows Reduction in Mill Backlogs—Two Large Automobile Plants to Shut Down Temporarily

CLEVELAND, Oct. 1.—The fourth quarter has started with mill backlogs much reduced on some products and wiped out on others. Now that some of the mills are in actual need of orders, a tendency toward price weakness is apparent in some lines. While a few fair-sized orders were placed by Michigan automobile companies during the week, the revival of that industry apparently will not come for several weeks.

Two of the leading makers of low-priced automobiles that have already reduced production to bring out new models are scheduled to shut down their plants this month, one for two to four weeks and the other for 30 days. These suspensions indicate that the automobile output in October will fall considerably below that of any recent month. Some of the motor car builders are preparing to get under production on new models about Nov. 1, but the indications are that this industry will not get under operation at more than a moderate pace during the remainder of the year.

Galvanized sheets have again weakened and concessions are appearing on black sheets. It seems probable that automobile body sheets will be definitely established for the quarter at 4c., base, or a \$2 a ton reduction. Concessions are reported on wide hot-rolled strip. Wire rods have definitely settled to \$40, Cleveland. There has been some shading by one outside mill to 1.90c., Cleveland, on steel bars to meet local mill competition. The Cleveland base on cold-finished steel bars has been reduced \$1 a ton.

Pig Iron.—Sales declined the past week, but inquiry showed a little gain. Cleveland interests sold 21,000 tons of foundry and malleable iron during the week. Many foundries in the automotive industry have not purchased iron for the last quarter, possibly because of the uncertainty as to the extent of their operation during the remainder of the year. Shipments during September were slightly heavier than in August, but are expected to fall off this month because of reduced shipping orders from automotive foundries. Consumers in other fields are taking iron at a good rate. Only two or three inquiries have come

out for first quarter contracts, and no sales are reported for that delivery. A Columbus, Ohio, foundry is inquiring for 2000 tons of malleable iron for the remainder of the year. Other inquiries, all for foundry grades, include 350 tons from the New York Central Railroad, 600 tons from Tiffin, Ohio, and 500 tons from Erie, Pa. The market is firm at \$18.50, Cleveland, for out-of-town shipment; \$19, furnace, for local delivery, and \$20, Lake

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.65c.
Cold-fin. flats and sq.	4.15c.
Hoops and bands, No. 12 to 14 in. inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.70c. to 3.90c.
Galvanized sheets (No. 24)	4.60c. to 4.75c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb.	\$2.80
No. 9 gal. wire, per 100 lb.	3.25
Com. wire nails, base per keg	2.80

*Net base, including boxing and cutting to length.

Wire Products.—Specifications are light and new business is confined to small lots. Some car lot sales are being made at 2.40c. for wire and at \$2.45 a keg for nails.

Cold-Finished Steel Bars.—Producers have reduced the Cleveland base on cold-finished steel bars \$1 a ton to 2.30c. There are now four basing points with the same price, Pittsburgh, Cleveland, Chicago and Buffalo. Those northern Ohio consumers who have been buying on a Pittsburgh base will now get the benefit of the reduced Cleveland base. Some fourth quarter contracts that have been written at 2.35c. will be revised to the new base. Specifications continue light.

Bars, Plates and Shapes.—Specifications continue rather light. The curtailment of the automotive industry has resulted in a decided falling off in the demand for steel bars. Local forge shops engaged in automotive work are operating at greatly reduced capacity. Plates and structural material are in fair demand. Some of the builders of road machinery have curtailed production, but steam shovel makers continue at capacity. Local mills need tonnage in steel bars, and the 1.90c., Cleveland, price has become more common for out-of-town shipment. This price in some cases has been met by an outside mill. However, considerable fourth quarter contracting has been done at 1.95c. Plates and structural shapes appear firm in this market at 1.95c., Pittsburgh.

Coke.—A 25c. a ton price advance on by-product nut coke for domestic use to \$4.50, ovens, has been announced by one Ohio producer, effective Oct. 1. Egg coke remains at

\$4.75. Foundry coke is quiet, with prices unchanged. Ohio by-product foundry coke is quoted at \$8.25, ovens.

Old Material.—Shipments of steel making scrap to some of the mills in the Youngstown and Canton districts were held up during the week. As a result, Youngstown dealers have withdrawn from the market and prices in that district are weak. Locally, the market continues dull and weak. Shipments are still restricted by local mills and dealers are buying small lots to fill outstanding orders. In the absence of transactions most quotations are unchanged. Compressed sheet steel has declined 50c. a ton.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	\$15.25 to \$15.50
No. 2 heavy melting steel	14.50 to 15.00
Compressed sheet steel	15.00 to 15.50
Light bundled sheet stampings	12.00 to 12.50
Drop forge flashings	13.00 to 13.25
Machine shop turnings	10.00 to 10.50
Short shoveling turnings	11.50 to 12.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00 to 16.50
No. 1 busheling	13.25 to 13.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00

Acid Open-Hearth Grades:	
Low phos., forging crops	17.75 to 18.00
Low phos., billet, bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50

Blast Furnace Grades:	
Cast iron borings	10.25 to 10.50
Mixed borings and short turnings	10.25 to 10.50
No. 2 busheling	10.25 to 10.50

Cupola Grades:	
No. 1 cast	17.50 to 18.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.00

Miscellaneous	
Railroad malleable	18.00 to 18.50
Rails for rolling	16.25 to 16.50

Pennsylvania, which normally uses scrap, but occasionally buys limited quantities of basic as a substitute for stove plate.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$21.26 to \$21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.26
East. Pa. No. 1X	22.26 to 22.76
Basic (del'd east. Pa.)	19.75 to 20.25
Gray forge	20.00 to 20.50
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. br'g low phos. (f.o.b. furnace)	23.50 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	24.04
Va. No. 2X, 2.25 to 2.75 sil.	24.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

Billets.—Few contracts have been closed for the last quarter, as consumers in most cases have fair stocks, and in certain instances have not fully specified their third quarter commitments. Quotations are unchanged at \$35 a ton, Pittsburgh, for rerolling billets and \$40, Pittsburgh, for forging quality.

Bars.—Action of some mills in revising bar contracts to 1.90c., Pittsburgh, or 2.22c., delivered Philadelphia, has not yet been followed generally in eastern Pennsylvania, but the change is expected in a few days. Sellers here are inclined to believe that 1.90c., Pittsburgh, will apply on contracts and on orders for a carload or more of bars, but 1.95c., Pittsburgh, or 2.27c., Philadelphia, will continue to be quoted on less than carload business, which makes up a considerable part of the present buying activity.

Reinforcing Bars.—Prices of billet steel bars are unchanged at 1.95c. to 2c., Pittsburgh, or 2.27c. to 2.32c., delivered Philadelphia, with no extra for cutting to length. Rail steel bars are quoted at 1.95c., Franklin, Pa., or Tonawanda, N. Y., or 2.27c., delivered Philadelphia, with no extra for cutting to length, but actual transactions are at concessions from this price to meet the competition of billet steel bars. The new hospital for the Women's Medical College,

Philadelphia

Bars, Shapes and Black Sheets Lower—Radio and Automobile Parts Makers Curtail Operations

PHILADELPHIA, Oct. 1.—Downward revision of \$1 a ton on steel bar contracts in eastern Pennsylvania, following the change in the Pittsburgh district, has not yet been made, but the change to 1.90c., Pittsburgh, is expected in a few days. Meanwhile, the shape market has shown a softer tendency, although business continues moderately active and fabricators are well engaged. Black and galvanized sheet prices are lacking in firmness and sellers of high finished sheets are developing an increasing tendency to use 2.75c., base Pittsburgh, in figuring extras. Plate prices show no change, mills being fairly well engaged and looking forward to a fair demand for plates from shipbuilders and the railroads.

Allocation of 310,000 tons of rails for the Pennsylvania Railroad will be made on Oct. 10 and 200,000 tons for the New York Central Railroad on Oct. 9. Railroads continue active buyers of small tonnages of material. Steel axles and other car materials were recently placed with an eastern Pennsylvania mill by the Pennsylvania Railroad.

Pig Iron.—Foundry iron buying for fourth quarter delivery has not been extensive, some consumers having sufficient on hand, or due on contracts, to carry them temporarily, and others prefer to cover only for short periods under present market conditions. Southern foundry iron is still being sold to consumers in this district, but the total of such tonnage

is diminishing. About 2000 tons of foundry iron was recently purchased by a Flemington, N. J., consumer from an eastern Pennsylvania steel company furnace. About 1000 tons of foundry iron for the American Engineering Co., Philadelphia, has not yet been closed. Basic iron is inactive, except for the purchase of a carload by a steel company in eastern

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier	2.70c.
Plates, 3/8-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1 1/2 x 1 1/2 in.	3.50c.
Round-edge steel planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.60c.
Cold-fin. steel, sq. and flats	4.10c.
Steel hoops	3.55c.
Steel bands, No. 12 to 1/8-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.10c.
†Galvanized sheets (No. 24)	4.85c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'd sheets (No. 13)	3.40c.
Diam. pat. floor plates—	
1/4-in.	5.30c.
3/8-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Philadelphia, requiring 400 tons of bars, has been awarded to the Roslyn-Gilmore Steel Co., and rail steel bars will be used.

Shapes.—Although a sizable tonnage of business is being booked and shape mills are able to maintain about 80 per cent operations, prices at which business has recently been taken show a range from 1.90c. to 2c., f.o.b. nearest mill to consumer, or 1.96c. to 2.06c., delivered Philadelphia.

Plates.—Mills are operating at about 80 per cent of capacity and, with continued shipbuilding activity and railroad buying in prospect, are maintaining plate prices at 2.05c., Coatesville, or 2.15c., delivered Philadelphia. Contracting for last quarter delivery by plate consumers has not been heavy, but in the few cases that contracts have been made, 2.05c., Coatesville, has been maintained.

Sheets.—With consumption of sheets considerably less than available capacity, mills are seeking tonnage, and both black and galvanized sheet prices show a lack of strength. Local automobile manufacturers have curtailed their sheet buying and the leading radio manufacturer in this district has curtailed output greatly, at the same time requesting postponement of deliveries on contracts for sheets and other materials. Black sheets are still quoted at 2.85c., Pittsburgh, or 3.17c., delivered Philadelphia, but desirable business has been placed at concessions of \$1 or \$2 a ton. Recently, mills selling high finished sheets have been inclined to add finishing extras on a black sheet base of 2.75c. a lb., Pittsburgh. Galvanized sheets are still quoted by some mills at 3.60c., Pittsburgh, or 3.92c., Philadelphia, but business is rather generally at 3.50c. to 3.55c., Pittsburgh, or 3.82c. to 3.87c., delivered Philadelphia. Blue annealed

sheets continue at 2.25c. to 2.35c., Pittsburgh, or 2.57c. to 2.67c., Philadelphia, for No. 13 gage and 2.10c. to 2.20c., Pittsburgh, or 2.42c. to 2.52c., Philadelphia, for light plates, blue annealed, No. 10 gage.

Imports.—In the week ended Sept. 28, 7227 tons of chrome ore arrived at this port, of which 3180 tons was from Portuguese Africa, 2347 tons from South Africa and 1700 tons from Greece. Steel arrivals consisted of 15 tons of structural shapes, 20 tons of steel hoops and 20 tons of steel scrap from the United Kingdom, 3 tons of drill steel and 2 tons of wire rods from Sweden and 78 tons of structural shapes from Germany.

Old Material.—Prices of most grades of scrap are unchanged, but the tendency of the market is toward lower levels, and, when new contracts are made, downward revision of prices would not be unexpected.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$16.00 to \$16.50
Scrap T rails	15.50 to 16.00
No. 2 heavy melting steel	12.50 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	11.50
Hydraulic compressed, new	14.50 to 15.00
Hydraulic compressed, old	12.00 to 12.50
Machine shop turnings (for steel works)	12.00
Heavy axle turnings (or equiv.)	14.00 to 14.50
Cast borings (for steel works and roll mill)	11.00 to 11.75
Heavy breakable cast (for steel works)	14.50 to 14.75
Railroad grate bars	12.00 to 12.50
Stove plate (for steel works)	12.00 to 12.50
No. 1 low phos., hvy., 0.04% and under	22.00 to 23.00
Couplers and knuckles	19.50 to 20.50
Roller steel wheels	19.50 to 20.50
No. 1 blast furnace scrap	10.50 to 11.00
Wrought iron and soft steel pipes and tubes (new specific)	15.00
Shafting	19.00 to 20.00
Steel axles	23.00 to 23.50
No. 1 forge fire	14.00
Cast iron carwheels	16.50 to 17.00
No. 1 cast	16.00 to 16.50
Cast borings (for chem. plant)	14.50
Steel rails for rolling	16.50 to 17.00

International Derrick Buys Boykin Company

International Derrick & Equipment Co., Columbus, Ohio, has purchased the capital stock and manufacturing plant of the Boykin Machinery & Supply Co., Beaumont, Tex., which has been reorganized as a subsidiary company of the former under the name of the International Derrick & Equipment Co. of Texas, with Harry M. Runkle, Columbus, as president; B. Boykin, Jr., Beaumont, vice-president and general manager; and L. L. Powell, Houston, Tex., secretary and treasurer.

A new steel foundry and office building, as well as other structures, are being added to the Beaumont plant. The International company also owns the Houston Galvanizing & Plating Co., Houston, which has begun construction of a structural and galvanizing plant for production of the company's tower and metal building line.

The Boykin Company has manu-

factured rotary drilling equipment for many years, while the International Company makes a large line of rust-resisting steel products for the oil, gas, artesian well, power and aviation industries, as well as steel buildings, electrical power transmission equipment, railroad towers and building equipment, airway and airport towers, forest observation towers, hangars and other aeronautical products.

Sheffield Metallurgists at National Metal Congress

One of the features of the National Metal Congress and Exposition held in Cleveland, Sept. 9 to 13, was the presence of a large number of men who were either born or obtained their early training in Sheffield, England. Many of them have made notable contributions to the science and advance of steel metallurgy in different lines. Among these were the following:

Dr. George B. Waterhouse, now professor of metallurgy, Massachusetts In-

stitute of Technology, Cambridge, Mass.; Charles K. Everitt, managing director, Edgar Allen & Co., Sheffield; Sidney Grayson, president, Jessop Steel Co., Washington, Pa.; Frank Hodson, president, Empire Steel Castings, Inc., Reading, Pa.; J. Kent Smith, consulting metallurgist, and associated with Climax Molybdenum Co., Detroit; Allwyn Wild, president Rustless Iron Corporation of America, Baltimore; Victor F. J. Tlach, president, Darwin & Milner, Inc., Cleveland; Oliver Smalley, consulting metallurgist, New York, and associated with Jessop Steel Co., Washington, Pa.; F. C. A. Lantsherry, William Jessop & Sons, Sheffield; George Batty, director of the Steel Castings Development Bureau, Philadelphia; Frank W. Brooke, chief engineer, William Swindell Brothers, Pittsburgh; T. Holland Nelson, consulting metallurgist, Philadelphia.

Withdraws from Boat Operation

Stewart Furnace Co., Cleveland, owner of a blast furnace at Sharon, Pa., will withdraw from the Lake transportation business in which it has long been engaged. It has sold its four Lake boats, which have been operated by Harvey H. Brown & Co., an affiliated interest, to the Youngstown Steamship Co., which is owned by the Youngstown Sheet & Tube Co. The ore boats of the Youngstown Steamship Co. are operated by Pickands, Mather & Co.

Revised New York Building Code May Allow Welding

Provisions that the allowable unit stress of steel structures be increased from 16,000 to 18,000 lb. a sq. in. and that welding be permitted under strict regulations in the construction of steel buildings have been recommended for inclusion in the proposed new building code being drafted by the City of New York. Recommendation also is made that the use of special alloy and high-carbon steels be permitted as rapidly as their qualities can be ascertained and specific silicon and nickel steels already on the market are named as acceptable.

The findings were made jointly by the subcommittee on structural steel and iron and the subcommittee on materials, loads and stresses of the Merchants' Association of New York. The subcommittees point out that adoption of these recommendations will result in a decrease of from 2 to 5 per cent in the cost of building.

Increases in industrial employment in the seventh Federal Reserve district during the period July 15 to Aug. 15 were about as large in the aggregate as the losses of a month earlier. Gains of 0.7 per cent in the number of workers and 3.9 per cent in payroll offset the declines of 0.2 and 5.0 per cent respectively, recorded for the preceding period. The metals and metal products group almost entirely recovered the loss reported in the previous month.

Birmingham

Pig Iron Sales Decline as Fourth Quarter Needs Are Well Covered—Steel Buying Fairly Good

BIRMINGHAM, Oct. 1.—Sales of pig iron to district consumers are beginning to ease off as the volume of fourth quarter requirements under contract approaches 75 per cent. Apparently buyers are still following the policy of covering part of their quarterly requirements and placing repeat orders from time to time as their needs are more clearly defined. Sales of Birmingham iron in competitive territories have also dropped. Inquiries for first quarter iron in outside districts have not begun to develop, and furnaces here make no predictions as to the extent they will compete in other markets for first quarter iron. The margin of shipments over output widened during the last half of September, and it is estimated that more iron was shipped during the month than in any previous month this year. The price situation is stronger. For district delivery, \$14.50 for No. 2 foundry is reported quite firm. There have been no changes in furnace operations in the past three weeks. Of the 13 active furnaces, eight are on foundry and five on basic iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:
No. 2 fdy., 1.75 to 2.25 sil. \$14.50
No. 1 fdy., 2.25 to 2.75 sil. 15.00
Basic 14.50

Finished Steel.—New orders during the last week of the third quarter showed a slight increase over those of the preceding week and compared favorably with any week since early August. Backlogs are as large now as they were 30 days ago, and perhaps larger. Shipments are steady. Inquiries for wire products are stronger, and further improvement is expected in October. Tentative plans call for the opening of the Ensley rail mill by the third week in October. With this mill back in operation, finished steel mill operations in the district will be close to the peak of the year. The new plant of the Pullman Car & Mfg. Corporation at Bessemer is being placed in operation today. Effective in the last quarter, black sheets were reduced \$1 a ton to 3c. All other prices are the same. New business of structural steel fabricators in September was lower than in any of the previous six or seven months. Current orders are mostly under 100 tons each. Prospects are reported good for an increase in tonnage during October. Fabricated plate work is at the low point of the year, with the October outlook reported only fair. The total of active open-hearth furnaces has remained at 17 for the past three weeks. The Tennessee company is working seven at Fairfield and four at Ensley. The Gulf States Steel Co. has all six in operation at Alabama City.

Cast Iron Pipe.—Scattered carload orders predominate in the pressure pipe market. Orders above 200 tons are rare. Most of the business is com-

ing from outside points, the tonnage up for figures in the Southern territory being the lightest in several months. The American Cast Iron Pipe Co. has booked a few orders of 100 to 200 tons each for shipment to the Pacific Coast. Inquiries for next year have not begun to develop. Prices remain at \$37 to \$38 a net ton, Birmingham, on 6-in. and larger sizes.

Coke.—Contract requirements for foundry coke are moving freely. Sixty additional by-product ovens were placed in operation last week by the

Semet-Solvay Co. Of the 1380 ovens in the district, less than 10 are idle.

Old Material.—A gradual improvement in steel grades during September has placed these lines in a fairly good position. Iron scrap has been without improvement, and prices have been reduced 50c. a ton on No. 1 cast and \$1 a ton on tramcar wheels. Other prices are unchanged.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$13.00 to \$13.50
Scrap steel rails.....	14.00
Short shoveling turnings..	9.00
Cast iron borings.....	9.00
Stove plate	11.50 to 12.00
Steel axles	21.00
Iron axles	23.00
No. 1 railroad wrought....	10.00 to 10.50
Rails for rolling.....	15.50
No. 1 cast.....	13.00
Tramcar wheels.....	12.50
Cast iron carwheels.....	13.00 to 13.50
Cast iron borings, chem....	13.50 to 14.00

Boston

Pig Iron Sales Light—Demand for Scrap Declines and Prices Are Weaker—Steel Buying Falls Off

BOSTON, Oct. 1.—Pig iron sales the past week continued light. The largest was 1000 tons of malleable at the equivalent of \$17.50 a ton, Buffalo. The next largest sale was 500 tons of No. 1X Mystic iron to the Westinghouse Electric & Mfg. Co., Springfield, Mass. A New York furnace competed actively for this order, and it is understood the seller had to make a price concession to obtain the business. Competing furnaces are now quoting prices equivalent to \$17.50 a ton, base Buffalo. Buffalo stacks are cautioning foundries that rail and water freights probably will expire on or before Nov. 1. The Mystic Iron Works management announces that, contrary to common report, its furnace is not to be relined within the near future.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25..	\$21.78 to \$22.28
†Buffalo, sil. 2.25 to 2.75..	22.28 to 22.78
*Buffalo, sil. 1.75 to 2.25..	22.41 to 22.91
*Buffalo, sil. 2.25 to 2.75..	22.91 to 23.41
East. Penn., sil. 1.75 to 2.25..	22.65 to 23.15
East. Penn., sil. 2.25 to 2.75..	23.15 to 23.65
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	24.11
*Ala., sil. 2.25 to 2.75.....	24.61
†Ala., sil. 1.75 to 2.25.....	20.25
†Ala., sil. 2.25 to 2.75.....	20.75

Freight rates: \$4.91 all rail from Buffalo, and \$4.28 rail and water; \$3.65 all rail from eastern Pennsylvania; \$5.21 all rail from Virginia; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

Bars, Shapes and Plates.—Mill representatives report a falling off in the demand for bars, shapes, plates and steel products in general. The bar price situation has become unsettled.

Reinforcing Steel.—Current buying of billet steel bars is confined to small tonnages at 2.66½c. a lb., base, from stock. Large tonnages hanging over the market for several weeks apparently are no nearer closing than a

week ago. The market for rail steel bars is quiet at 2.26½c. a lb., delivered common Boston freight rate points.

Coke.—The movement of by-product foundry coke from ovens to consuming plants is not so heavy as heretofore. So far, there has been little if any stocking by foundries for the winter. The price remains at \$11 a ton, delivered within a \$3.10 freight rate zone.

Warehouse Business.—For the second time within a month, wire nails have been cut 10c. a keg. The warehouse price is now \$3.30 a keg, base. The demand for iron and steel, while more active than it was a month ago, is not so large as expected.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes....	3.265c.
Plats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....	*3.55c. to 5.55c.
Squares and flats.....	*4.05c. to 7.05c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.
Per Cent Off List	
Machin bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Cast Iron Pipe.—The United States Pipe & Foundry Co. was the low bidder on 250 tons of 12-in. pipe for Providence, R. I. No award has been made. Ayer, Mass., on Sept. 30 closed bids on 7800 ft. of 6 and 8-in. pipe. Westfield, Mass., will close bids on Oct. 12 for several thousand feet of pipe for a water supply extension. A Massachusetts utility company is feeling out the market on a large tonnage, presumably for 1930 requirements. The market for small pipe is steady, but concessions are still available on large dimensions. Prices quoted openly on domestic pipe are: 4 in., \$44.10 to \$45.10 a ton, delivered common Boston freight rate points; 6 to 12 in., \$40.10 to \$41.10; 16 to 20 in., \$39.60. A \$4 differential is asked on Class A and gas pipe. During September 842 pieces of French pipe were received at Boston.

Old Material.—Demand for most grades of old material is limited and prices are unsettled. Steel turnings are an exception. A week ago sales were reported at \$6.60 a ton, on cars shipping point, but \$7 is the lowest price today, and supplies at that figure are not excessive. In contrast, there has been a further shrinkage of 25c. a ton on No. 1 heavy melting steel, and long bundled skeleton has dropped 50c. a ton since a Worcester, Mass., consumer ceased buying. Brokers see no indication of improved scrap this month.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$11.00 to \$11.50
Scrap T rails	10.50 to 11.00
Scrap girder rails	10.00 to 10.50
No. 1 railroad wrought	11.00 to 11.50
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	7.00 to 7.25
Cast iron borings (steel works and rolling mill)	6.50 to 6.75
Bundled skeleton, long	9.00 to 9.50
Forge flashings	9.50 to 10.00
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	9.00 to 9.50
Shafting	13.50 to 14.00
Steel car axles	17.50 to 18.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.50 to 10.00
Rails for rolling	12.00 to 12.50
Cast iron borings, chemical	9.75 to 10.00

Prices per gross ton deliv'd consumers' yards:

Textile cast	\$14.00 to \$14.50
No. 1 machinery cast	15.00 to 15.25
No. 2 machinery cast	13.00 to 13.25
Stove plate	11.00 to 11.50
Railroad malleable	18.00 to 18.50

Warehouse Prices, f.o.b. St. Louis

Base per Lb.	
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shaftings, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	5.10c.
Blue ann'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	5.15c.
Structural rivets	3.95c.
Boiler rivets	3.95c.
Per Cent Off List	
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

St. Louis

10,000 Tons of Basic Pig Iron Sold—Improvement in Demand for Steel Products—Scrap Weak

ST. LOUIS, Oct. 1.—The principal pig iron transaction of the week was the sale of 10,000 tons of basic iron to a district 'melter' by the St. Louis Gas & Coke Corporation, which sold an additional 3250 tons of iron, including 2000 tons of foundry, to a district stove manufacturer, 650 tons to an Illinois implement maker and 400 tons to an Illinois equipment builder, all for shipment during the remainder of the year. Sales of Southern iron have slowed up some. The market is firmer, makers generally being satisfied with the state of their backlogs. October shipments of the local maker are expected to exceed 34,000 tons.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25	
f.o.b. Granite City, Ill.	\$19.50 to \$20.00
Malleable, f.o.b. Granite City	20.00
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	16.92 to 18.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Finished Iron and Steel.—An improvement is reported in new business and specifications against contracts. The Granite City Steel Co. is operating all of its rolling mills, except the plate mill, at 100 per cent. Plate rollings are at 75 to 80 per cent of capacity. Demand for galvanized sheets for roofing purposes is fairly good. Tin plate buying also is good. The structural trades report business quiet, with no large contracts in sight. Wire and wire products are fairly active.

Coke.—Sales of domestic grades of coke by the Granite City by-product ovens are ahead of production, dealers showing increasing interest. Foundry coke is in good demand, and smelters

are taking their full quotas of furnace coke.

Old Material.—The market for old material is quiet. The only sale of consequence was a tonnage of miscellaneous rails at \$16.75 and specialties at \$19 to an East Side consumer, but this buyer later cut its prices. Heavy railroad offerings and shipments from country dealers tend to depress the market. The latter movement is slowing up considerably as the result of reduced prices. Miscellaneous standard-section rails, rails for rolling, and stove plate are off 25c. a ton. Iron car axles are up \$1. Railroad lists: Pennsylvania Railroad, 58,000 tons; Missouri Pacific, 4500 tons; St. Louis-San Francisco, 1900 tons; Nashville, Chattanooga & St. Louis, 500 tons; Chicago, Milwaukee, St. Paul & Pacific, 600 tons.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	\$14.00 to \$14.50
No. 2 heavy melting or shoveling steel	13.25 to 13.75
No. 1 locomotive tires	15.50 to 16.00
Miscel. stand-sec. rails including frogs, switches and guards, cut apart	16.00 to 16.50
Railroad springs	18.00 to 18.50
Bundled sheets	10.50 to 11.00
No. 2 railroad wrought	14.00 to 14.50
No. 1 busheling	10.00 to 10.50
Cast iron borings and shoveling turnings	9.50 to 10.00
Iron rails	13.00 to 13.50
Rails for rolling	16.50 to 17.00
Machine shop turnings	7.50 to 8.00
Heavy turnings	10.00 to 10.50
Steel car axles	19.50 to 20.00
Iron car axles	27.50 to 28.00
Wrot. iron bars and trans.	21.50 to 22.00
No. 1 railroad wrought	13.75 to 14.25
Steel rails, less than 3 ft.	18.00 to 18.50
Steel angle bars	15.25 to 15.75
Cast iron car wheels	15.00 to 15.50
No. 1 machinery cast	15.25 to 15.75
Railroad malleable	16.00 to 16.50
No. 1 railroad cast	14.75 to 15.25
Stove plate	12.75 to 13.25
Agricuilt. malleable	15.25 to 15.75
Relay, rails, 60 lb. and under	20.50 to 23.50
Relay, rails, 70 lb. and over	26.50 to 29.00

Youngstown

Valley Mills Operating At Less Than 80 Per Cent—Declining Demand Brings Out Price Concessions

YOUNGSTOWN, Oct. 1.—The steel industry in the Valleys enters the fourth quarter with operations on a hand-to-mouth basis on all products with the possible exception of pipe and with an operating rate of less than 80 per cent. The schedules of sheet mills are best, averaging from 90 per cent to capacity, while other products range from 60 to 70 per cent.

Curtailment in the demands of automobile companies is the principal reason for the sharp decline during September, as other consuming industries are still taking steel at a fair rate, and there is no indication of any marked curtailment during the last three months of the year.

Comparatively high operations in the pipe mills are a bright spot in the

picture. One large producer expects a record run in its pipe department during October, while the maker of the electrically welded products is securing more than enough business to keep its mill constantly occupied. Curtailment in tin plate operations has not been so great as might be expected for this time of the year, and, with buying for the next season less than a month away, the situation is rather satisfactory. Reduced operations in the strip mills has been accomplished largely by longer suspensions over the week-ends and mills are securing enough week-to-week business to keep both the hot and cold-rolled departments busy for the greater part of the week. The average operating rate for the district is approximately 75

per cent. Bar business is not so good, with the operations probably lower.

In the face of reduced demand for steel, a buyers' market has developed. One reason for the delay in fourth quarter contracting is a deadlock over prices. Buyers of steel recall that in previous years price weakness usually followed declining demand, and mills are having difficulty in convincing them that this time is to be an exception. Developments in the last two weeks indicate that buyers are gradually gaining the advantage. Sheet prices in general are weak. Youngstown mills still adhere to a quotation of 3.60c., Pittsburgh, on galvanized sheets, but this price is not holding. The usual \$2 concession to jobbers is being extended to the trade by large makers at nearby points. Weakness in galvanized material may also have some influence on black sheet prices. Valley sheet mills are doing their best to hold the price of black sheets at 2.85c., Pittsburgh, although large buyers in Michigan are admittedly getting the usual concessions. Light plates, blue annealed, and blue annealed sheets are still fairly well represented at 2.10c. to 2.20c., Pittsburgh, for No. 10 gage and at 2.25c. to 2.35c. for No. 13. The lower figures are not recognized by all sellers. Strip prices are weak, but there has been no open break in the market.

On bars, Youngstown makers are not meeting the Cleveland base, which has declined to 1.90c., and are adhering to 1.95c., Pittsburgh, in quoting on fourth quarter business. This quotation is not bringing in orders, and concessions of \$1 a ton are occurring more frequently. A range of 1.90c. to 1.95c., Pittsburgh, is now necessary to include the full list of buyers of this product.

Pig iron prices are holding, and strength was given to the market by the purchase of 5000 tons of basic iron by the American Steel Foundries at Alliance, Ohio, at \$18.50, Valley furnace. The foundry grade is quoted at the same level, while malleable and Bessemer are at \$19. Buying has been rather light. The scrap market is weak at \$17.50 to \$18 for No. 1 heavy melting steel and 25c. to 50c. less for compressed sheets.

structural and 240 tons of reinforcing bars. A local fabricator has contracted for 185 tons for a grade crossing elimination for the New York Central Railroad at Rome, N. Y. Another contract placed was 325 tons of structural steel for a Buffalo apartment house. Warehouse business is reported to be holding up very well.

Canada

Substantial Volume of Pig Iron Business

TORONTO, ONT., Oct. 1.—With the opening of fourth quarter, Canadian pig iron melters are showing more interest in placing contracts for iron to be delivered in the next three months. Producers are carrying a large volume of future business on their books. The daily iron melt is well sustained, and there appears little possibility of a slump in the immediate future. No curtailment in production has been made by Canadian blast furnaces. Pig iron prices are steady.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$24.60
No. 2 fdy., sil. 1.75 to 2.25.....	24.10
Malleable	24.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$26.00
No. 2 fdy., sil. 1.75 to 2.25.....	25.50
Malleable	26.00
Basic	24.50
Imported Iron, Montreal Warehouse	
Summerlee	\$33.50
Carron	33.00

Structural Steel.—Although new business is on a smaller scale than that of two or three months ago, tonnages are appearing in substantial volume. Contracts placed during the week ranged from 50 to 3000 tons.

Old Material.—New business is increasing. Improvement is noted in both spot sales and future contracts. The current demand continues to favor iron grades, although steel lines are improving in some localities. Despite the fact that old material prices have been sliding downward in many districts across the international boundary, Canadian prices are holding at their recent levels.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel.....	\$10.00	\$8.50
Rails, scrap	11.00	9.00
No. 1 wrought.....	10.00	12.00
Machine shop turn- ings	7.50	5.00
Boiler plate	7.50	6.00
Heavy axle turnings	8.00	7.50
Cast borings.....	7.50	5.00
Steel borings.....	7.50	6.50
Wrought pipe	6.00	6.00
Steel axles	15.00	20.00
Axles, wrought iron	17.00	22.00
No. 1 machinery cast .....	.....	17.00
Stove plate .....	.....	13.00
Standard carwheels.....	.....	16.00
Malleable .....	.....	13.00
Per Net Ton		
No. 1 mach'ry cast.....	\$16.00	.....
Stove plate	12.00	.....
Standard carwheels.....	15.00	.....
Malleable scrap.....	14.00	.....

The Carnegie Steel Co. has purchased a Freyn-Design continuous stock-line recorder for use at its blast furnace plant at South Duquesne, Pa.

Buffalo

Steel Backlogs Reduced—Pig Iron Sales Have Declined—Scrap Market Quiet and Prices Are Lower

BUFFALO, Oct. 1.—District foundries are purchasing only sufficient pig iron to supply their nearby needs, in consequence of which business has fallen off considerably. Most of the furnaces could book more tonnage for the rest of the year, although their backlogs are considerable, and in one instance just sufficient to take care of regular customers' excess requirements. The sales of Buffalo furnaces in New England have eased off. Considerable Buffalo iron is being shipped to Milwaukee and Chicago.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25.....	\$19.50
No. 2X fdy., sil. 2.25 to 2.75.....	20.00
No. 1 fdy., sil. 2.75 to 3.25.....	21.00
Malleable, sil. up to 2.25.....	20.00
Basic	18.50
Lake Superior charcoal.....	27.28

Old Material.—Conditions are quieter than they have been at any time this year. Mills which have experienced some decrease in operation have become cautious about extended purchasing. No. 1 heavy melting steel is bringing no more than \$17 to \$17.50, with the chances good that a

tonnage could be purchased at a lower figure.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel.....	\$17.00 to \$17.50
No. 2 heavy melting steel.....	14.75 to 15.00
Scrap rails	16.50 to 17.00
Hydraul. comp. sheets.....	14.50 to 14.75
Hand bundled sheets.....	12.00 to 12.50
Drop forge flashings.....	14.25 to 14.50
No. 1 busheling	15.50 to 16.50
Hvy. steel axle turnings.....	14.00 to 14.50
Machine shop turnings.....	8.00 to 8.50
No. 1 railroad wrought.....	13.00 to 13.50
Acid Open-Hearth Grades:	
Knuckles and couplers.....	19.00 to 20.00
Coil and leaf springs.....	19.00 to 20.00
Rolled steel wheels.....	19.00 to 20.00
Low phos. billet and bloom ends	20.00 to 20.50
Electric Furnace Grades:	
Short shov. steel turnings.....	12.50 to 13.00
Blast Furnace Grades:	
Short mixed borings and turnings	11.50 to 12.25
Cast iron borings.....	11.00 to 12.00
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles	18.75 to 19.25
Iron axles	21.00 to 22.00
Cupola Grades:	
No. 1 machinery cast.....	16.00 to 17.00
Stove plate	13.00 to 13.50
Locomotive grate bars.....	12.50 to 13.00
Steel rails, 3 ft. and under	19.50 to 19.75
Cast iron carwheels.....	14.00 to 14.50
Malleable Grades:	
Industrial	18.00 to 18.50
Railroad	18.00 to 18.50
Agricultural	18.00 to 18.50
Special Grades:	
Chemical borings	12.50 to 13.50

Finished Iron and Steel.—The Lackawanna plant of the Bethlehem Steel Co. is operating 21 of 24 open-hearths. Its Bessemer department is down. Donner Steel Co. is operating five to six open-hearths. Steel backlogs are being reduced. The Courier-Express Building will require 800 tons of

Warehouse Prices, f.o.b. Buffalo

Base per Lb.	
Plates and struc. shapes.....	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex.....	4.45c.
Rounds	3.95c.
Cold-rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.20c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'd sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$3.60
Black wire, base per 100 lb.....	3.75

Pacific Coast

Demand for Steel Products Continues Steady—Building Activity Increases—Pending Work Fairly Large

SAN FRANCISCO, Sept. 28 (By Air Mail).—Movement of iron and steel products continues on a fairly even keel. Outstanding among the week's orders were 1650 tons of structural shapes for a pulp plant in Everett, Wash., for the Puget Sound Timber & Pulp Co., placed with the Isaacson Iron Works, and 1000 tons of plates for the same interest for boilers and tanks, taken by the Puget Sound Machinery Depot. Pending business includes 2000 tons of reinforcing bars for approaches for the St. John's River bridge, Portland, and 5500 tons of cast iron pipe for Long Beach, Cal.

Building activity on the Pacific Coast during the past month has shown a healthy increase. The work of erecting the structural steel for the Southern Pacific bridge over the Carquinez Straits will be begun within a few days. Several new structures are planned in San Francisco, among them a 20-story office building on Montgomery Street.

Pig Iron.—Sales and inquiries continue to involve unimportant tonnages. Foundry operations lag. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	.....	\$25.00 to \$26.00
*Utah fdy., sil.	2.75 to	
3.25	.....	25.00 to 26.00
**Indian fdy., sil.	2.75 to	
3.25	.....	25.00 to 26.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Bars.—Pending business in reinforcing steel calls for nearly 5000 tons. Bids have been opened on 170 tons for a courthouse at Olympia, Wash., and bids will be opened on Oct. 16 for a bridge over the San Luis Rey River, Sacramento. The price structure continues unchanged at 2.30c., base, and 2.40c., base, in San Francisco and Los Angeles, respectively, on carload lots, and at 2.60c. and 2.70c., respectively, on smaller tonnages. Mild steel bars are firm at 2.35c., c.i.f.

Plates.—In addition to the 1000 tons for a pulp plant, mentioned above, the Puget Sound Machinery Depot took 400 tons for six locomotive boilers for the Great Northern Railroad at Seattle. After some delay, a pipe line at Bremerton, Wash., involving 200 tons, was finally awarded to James Coyne, who in turn sublet the fabrication to an unnamed interest. The only pending project of importance involves 140 tons for two syphons at La Mesa, Cal., bids on which will be opened Oct. 7. While the general quotation on plates continues at 2.35c., c.i.f., this price has been shaded in several instances on large and desirable tonnages.

Shapes.—Among the structural lettings were 185 tons for a store in Oakland, taken by the California Steel Co.; 850 tons for a conveyor frame at Azusa, Cal., for a dam, booked by the Consolidated Steel Corporation, and

Warehouse Prices, f.o.b. San Francisco

Base per Lb.	
Plates and struc. shapes	..... 3.15c.
Soft steel bars	..... 3.15c.
Small angles, $\frac{3}{8}$ -in. and over	..... 3.15c.
Small angles, under $\frac{3}{8}$ -in.	..... 3.55c.
Small channels and tees, $\frac{3}{4}$ -in. to	
2 $\frac{3}{4}$ -in.	..... 3.75c.
Spring steel, $\frac{1}{4}$ -in. and thicker	..... 5.00c.
Black sheets (No. 24)	..... 4.90c.
Blue ann'd sheets (No. 10)	..... 3.80c.
Galv. sheets (No. 24)	..... 5.30c.
Struct. rivets, $\frac{1}{2}$ -in. and larger	..... 5.65c.
Com. wire nails, base per keg	..... \$3.40
Cement c'd nails, 100 lb. keg	..... 3.40

100 tons for a theater in Stockton, placed with the Pacific Coast Engineering Co. Important pending projects involve 350 tons for a sugar warehouse in San Francisco, 405 tons for a bridge over the Trinity River and 1337 tons for a bridge over the San Luis Rey River, both in California. No change in quotations has occurred, 2.35c., c.i.f., remaining firm.

Cast Iron Pipe.—While pipe lettings are not heavy, pending business aggregated several thousand tons. Whittier, Cal., placed 109 tons of 4-in. Class

B pipe with the American Cast Iron Pipe Co. Bremerton, Wash., which had an inquiry out for 875 tons of 4 to 24-in. Class B pipe, cancelled the inquiry and purchased riveted steel pipe. San Diego, Cal., rejected bids on 144 tons of 4 and 6-in. Class B pipe for Plata Avenue and on 201 tons of 4 and 6-in. Class C pipe for El Prado Avenue. The Butterfield Construction Co. was low bidder on 460 tons of 4 to 8-in. Class B pipe for Chesterton Street, San Diego. Bids have been opened on 5585 tons of 4 to 12-in. Class B pipe for Long Beach, Cal. Azusa and San Diego, Cal., are calling for bids on 110 tons of 4 and 6-in. Class B pipe and on 230 tons of 4 and 6-in. Class C pipe, respectively.

Warehouse.—Out-of-stock distributors report business well sustained. Price changes have recently been announced in the bay district. Plates and structural shapes are now quoted at 3.40c.; small angles, 3/16-in. and over, have been raised from 3.15c. to 3.40c.; small channels and tees, $\frac{3}{4}$ in. to 2 $\frac{3}{4}$ -in., are now quoted at 3.90c.; spring steel, $\frac{1}{4}$ -in. and thicker, is 5.10c.; structural rivets, $\frac{1}{2}$ -in. and larger, are 4.50c.; black sheets, No. 24 gage, blue annealed sheets, No. 10 gage, and galvanized sheets, No. 24 gage, are being quoted at 5.00c., 4.00c. and 5.40c., respectively.

Cincinnati

Demand for Pig Iron Falls Off—Weakens in Scrap Market—Domestic Coke Shipments Larger

CINCINNATI, Oct. 1.—With foundries reported to have curtailed operations and automotive manufacturers displaying less interest in purchases, demand for pig iron in this district has receded sharply. In the past week sales were less than those of the preceding week, agents reporting that approximately 4500 tons in small lots was placed. The largest order was for three cars of foundry iron to be delivered to a southern Ohio consumer. Buyers, generally, are not showing any great interest in covering for fourth quarter requirements, but are purchasing as needs arise, although in some instances they are anticipating their needs about 30 days. Some foundries are reported to be carrying over a fair surplus of iron which was purchased the latter part of the second quarter in anticipation of a continued heavy demand from their customers during the third quarter. But a slight lull produced a surplus which will carry them into the fourth quarter. While none of the business placed was sufficient to test prices, the Northern iron brought about \$18.50, base Lake furnace, and the Southern was placed at prices ranging from \$13.50 to \$14.50, base Birmingham. Among the orders for the week were three cars of silvery sold on the present schedules. The trade is entering a

new quarter without any inquiry for pig iron.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil.	1.75 to	
2.25	.....	\$19.89 to \$20.39
Ala. fdy., sil.	1.75 to 2.25	17.19 to 18.19
Ala. fdy., sil.	2.25 to 2.75	17.69 to 18.69
Tenn. fdy., sil.	1.75 to 2.25	17.19 to 18.19
S'th'n Ohio silvery, 8 per		
cent	.....	26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Finished Material.—While the automotive demand for sheets has not increased greatly, other consumers who have been taking sheets in small quantities during the summer months have

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes	..... 3.40c.
Bars, soft steel or iron	..... 3.30c.
New billet reinforce bars	..... 3.15c.
Rail steel reinforce bars	..... 3.00c.
Hoops	..... 4.05c.
Bands	..... 3.50c.
Cold-fin. rounds and hex.	..... 3.85c.
Squares	..... 4.35c.
Black sheets (No. 24)	..... 4.05c.
Galvanized sheets (No. 24)	..... 4.90c.
Blue ann'd sheets (No. 10)	..... 3.45c.
Structural rivets	..... 3.85c.
Small rivets	..... .65 per cent off list
No. 9 ann'd wire, per 100 lb.	..... \$3.00
Com. wire nails, base per keg	..... 2.85
Cement c'd nails, base 100 lb. keg	..... 2.85
Chain, per 100 lb.	..... 8.75
Net per 100 Ft.	
Lap-weld steel boiler tubes, 2-in.	..... \$16.00
4-in.	..... 33.00
Seamless steel boiler tubes, 2-in.	..... 17.00
4-in.	..... 34.00

sharply increased their specifications. District operators report that a gradual increase in operations will take place within the next 10 days. Although the fabricated material market is still firm, new business is sluggish.

Coke.—The movement of foundry coke during September was not so good as during August. Prices on by-product foundry coke will continue at about \$10.05, delivered, in Cincinnati. With the advent of cooler weather, the movement of domestic coke is a trifle better, one oven representative reporting that a fair tonnage of this grade was shipped during the week into the Detroit area.

Old Material.—The softening in prices of old materials in other markets is being reflected in this district. Heavy melting steel and No. 2 wrought have been reduced to \$13.50 to \$14, and dealers expect that this weakness will spread to the entire market unless mill operations increase soon. The supply of material is larger than it was recently.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$13.50 to \$14.00
Scrap rails for melting.....	14.25 to 14.75
Loose sheet clippings.....	9.00 to 9.50
Bundled sheets.....	11.00 to 11.50
Cast iron borings.....	8.00 to 8.50
Machine shop turnings.....	8.25 to 8.50
No. 1 busheling.....	10.50 to 11.00
No. 2 busheling.....	7.00 to 7.50
Rails for rolling.....	14.50 to 15.00
No. 1 locomotive tires.....	14.25 to 14.75
No. 2 railroad wrought.....	13.50 to 14.00
Short rails.....	18.50 to 19.00
Cast iron car wheels.....	12.75 to 13.25
No. 1 machinery cast.....	19.00 to 19.50
No. 1 railroad cast.....	15.25 to 15.75
Burnt cast.....	10.25 to 10.75
Stove plate.....	10.25 to 10.75
Brake shoes.....	10.25 to 10.75
Agricultural malleable.....	14.25 to 14.75
Railroad malleable.....	15.25 to 15.75

Detroit Scrap Declines

DETROIT, Oct. 1.—The market on old material in the district has been very quiet during the past week, with few purchases of tonnage size. Busheling, flashings, sheet clippings and turnings have declined 50c. a ton during the past week.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hyv. melting and shov. steel.....	\$14.00 to \$14.50
Borings and short turnings.....	8.50 to 9.00
Long turnings.....	8.00 to 8.50
No. 1 machinery cast.....	12.50 to 13.00
Automobile cast.....	13.00 to 13.50
Hydraulic comp. sheets.....	14.00 to 14.50
Stove plate.....	9.00 to 9.50
New No. 1 busheling.....	12.00 to 12.50
Old No. 1 busheling.....	10.50 to 11.00
Sheet clippings.....	8.25 to 8.75
Flashings.....	12.50 to 13.00

Globe - Wernicke Co. and Unit Steel Co. Merged

Merger of the Globe-Wernicke Co., Cincinnati, and the Unit Steel Co., Dayton, Ohio, is confirmed by officials of both companies. John C. Haswell, president of the Dayton company, said that the Unit Steel Co. plant would be moved to Cincinnati. The Globe-Wernicke Co. manufactures office furniture and equipment and the Steel Unit Co. produces steel doors and partitions.

Concrete Bar Industry Adopts Trade Rules

Secret Rebates, Price Discrimination and Other Alleged Unfair Practices Are Condemned

WASHINGTON, Oct. 1.—The Federal Trade Commission has approved five and accepted 13 rules as expressions of the trade in connection with the trade practice conference of the reinforcing steel fabricating and distributing industry held at Asheville, N. C., on April 18. The rules as passed upon by the commission were made public last Thursday. The rules approved are designated as "Group I" and apply to unfair methods of competition. Those accepted as expressions of the trade are classified under "Group II."

"Group I" rules relate to inducing breach of contract; misbranding; secret rebates; discrimination in price and commercial bribery. "Group II" rules relate to a definition of the industry, circulation of current price lists; manner of submitting bids for each job; dumping; arbitration; standard forms of contract for sales; departure from original agreements with respect to terms of discount for cash; discriminatory prices; reduced price in event of a market decline; uniform method of cost finding; proper marketing and grading; and provision that the trade practice conference be made a continuing organization to act for progressive elimination of unfair and uneconomic trade practices in industry.

Some of the rules adopted are as follows:

GROUP I

Any willful attempt to induce a breach of any existing bona fide contract, or to prevent the performance of any contractual duty or service under any bona fide contract for the sale of reinforcing materials, is an unfair method of business.

The marking or branding of reinforcing materials (or any misrepresentation in connection with the sale of such materials) for the purpose or with the effect of misleading or deceiving purchasers with respect to the quantity, quality, grade substance, or origin thereof, is an unfair method of business.

The payment or allowance of secret rebates, refunds, credits, unearned discounts, whether in the form of money or gifts, the acceptance of securities at more than true market value, or otherwise, as a means of effecting or concealing price discrimination, or the extending to certain purchasers of special privileges, including discriminatory allowances for engineering, architectural or other services, not extended to all purchasers under like terms and conditions, are unfair methods of business.

Any discrimination in price for reinforcing materials between purchasers for the same grade, quality or quantity of product sold, after making due allowance for differences in cost of fabricating, servicing, selling, transportation and credit risks, or unless made in good faith to meet actual established competition, is an unfair method of business.

GROUP II

The entering into of contracts for reinforcing materials without actual obligation of the buyer to purchase any specified quantity or quantities, or for any particu-

lar jobs, for the purpose of securing to the buyer a special price, is condemned by the industry.

The industry approves the practice of each individual member of the industry independently publishing and circulating his own current price lists, and also notices of all advances, declines or other changes in price.

The industry approves the policy of each member submitting on each job a single bid based on individual costs and other factors deemed relevant by each firm or company, and of revising the quotation on any job only in the event of changes in plans or specifications as tending to place the industry in line with more businesslike merchandising methods in other progressive industries, and with accepted methods of bidding on Government contracts, and any violation of this policy is condemned by the industry.

The practice of dumping surplus stock outside of regular markets, at low discriminatory prices, is condemned by the industry.

The industry approves the settlement of controversies between members of the industry and those dealing with the industry by arbitration under the prevailing code in the industry.

The industry approves the policy of adopting standard forms of contract for sales, with clearly written and commonly understood provisions fair to both buyers and sellers, as tending to avoid controversy and to promote businesslike methods of distribution.

Any departure from original agreements with respect to terms of discount for cash or time of payment which results in discrimination between purchasers of the same class and under the same conditions is condemned by the industry.

Where several different concrete reinforcing materials are bid on at the same time, or for the same job, failure to quote a separate price on reinforcing bars and spirals, on wire mesh, on permanent and removable forms, and on other separate or unrelated products sold in connection with such materials and on the erection thereof or other labor to be performed thereon, or the making of the acceptance of any separately priced item in a quotation contingent upon the acceptance of another such item, where the purpose or the effect thereof is to secure to a buyer a discriminatory price, is condemned by the industry.

Contracts of sale which permit the buyer to cancel or provide for a reduced price in the event of a market decline, and which do not permit the seller to cancel or provide for an enhanced price in the event of a market rise, are lacking in mutuality and tend to induce controversy and breach of contract, and are condemned by the industry.

It is the judgment of this industry that an accurate knowledge of costs is indispensable to intelligent and fair competition, and the general adoption of accurate and uniform methods of cost finding and estimating as a means of correcting the various unfair practices heretofore mentioned is strongly recommended.

All contracts for the purchase or sale of reinforcing materials shall clearly state the quality and grade of such materials, and the quantity, or job on which the material is to be used, and any violation thereof is condemned by the industry.

Non-Ferrous Metal Markets

Copper Situation Favors Producers—Zinc and Lead Steady—Tin Declines

NEW YORK, Oct. 1.

Copper.—There are several factors in the market which give strength to the position of producers. In the first place, neither domestic nor foreign consumers have overbought, despite the unprecedented purchases early in September. They had refrained from placing orders for several months in an effort to break prices and when they finally came into the market they merely made up in part for the volume of business which ordinarily they would have contracted for in small quantities at frequent intervals. The fact that few bookings for December delivery have been made bears out this statement. Domestic shipments of copper in September were second only to the peak month of March, which is proof that users actually were in need of large tonnages to meet current needs rather than merely speculating in futures. Moreover, it is conservatively estimated that consumers will have to buy 200,000 tons to fill their requirements over the remainder of the year. Through recent purchases, consumers have got back into a normal position from a tonnage standpoint, but foreign users still are somewhat underbought. Fifty-eight thousand gross tons of copper was sold for export during September. Demand during the past week was of fair proportions, with electrolytic copper firm at 18c., delivered in the Connecticut Valley. The Lake copper market has been steady, with consumers buying at a moderate rate at 18c. to 18.12½c., delivered. The quotation of Copper Exporters, Inc., is 18.30c., c.i.f., usual European ports.

Copper Averages.—The average price of Lake copper for August, based on daily quotations in THE IRON AGE, is 18.12½c., delivered New York. The average price of electrolytic copper is 17.75c., refinery, or 18c., delivered in the Connecticut Valley.

Tin.—The Straits tin market was fairly active the first two days of the past week, when about 500 tons was sold for spot and October shipment. Some consumers had tin tendered to them on previous contracts and, since they were not in a position to use it, they resold it. Today the monthly tin statistics came out, showing a decrease of 1844 tons in the world's visible supply. Normally, such a favorable report should result in a firm market, but this development was off-

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Oct. 1	Sept. 30	Sept. 28	Sept. 27	Sept. 26	Sept. 25
Lake copper, New York.....	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	44.25	45.00	.....	45.125	45.00	45.00
Zinc, East St. Louis.....	6.80	6.80	6.80	6.80	6.80	6.80
Zinc, New York.....	7.15	7.15	7.15	7.15	7.15	7.15
Lead, St. Louis.....	6.70	6.70	6.70	6.70	6.70	6.70
Lead, New York.....	6.90	6.90	6.90	6.90	6.90	6.90

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

Prices on rolled non-ferrous products are unchanged from those prevailing one week ago.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	23.25c.
Copper, hot rolled.....	26.75c.
Zinc	10.25c.
Lead (full sheets).....	11.00c. to 11.25c.

Seamless Tubes—	
High brass	28.25c.
Copper	29.25c.

Rods—	
High brass	21.25c.
Naval brass	24.00c.

Wire—	
Copper	19.87½c.
High brass	23.75c.
Copper in Rolls	26.75c.
Brazed Brass Tubing.....	30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	23.25c.
Copper, hot rolled.....	27.75c.
Copper, cold rolled, 14 oz. and heavier	30.00c.
Zinc	10.75c.
Lead, wide	11.35c.
Seamless Tubes—	
Brass	28.25c.
Copper	29.25c.
Brass Rods	21.25c.
Brazed Brass Tubes.....	31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass.....	21.12½c. to 22.12½c.
Copper, hot rolled, base sizes	27.75c. to 28.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes	30.00c. to 31.00c.
Seamless Tubes—	
Brass	26.00c. to 27.00c.
Copper	29.12½c. to 30.12½c.
Brazed Brass Tubes.....	29.12½c. to 30.12½c.
Brass Rods.....	18.87½c. to 19.87½c.

New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.75c. to 11.25c.
Zinc sheets, open.....	11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	47.00c. to 48.00c.
Tin, bar	49.50c. to 50.50c.
Copper, Lake	19.50c.
Copper, electrolytic.....	19.25c.
Copper, casting	19.00c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig.....	7.62½c. to 8.12½c.
Lead, bar	9.62½c. to 10.12½c.
Antimony, Asiatic	11.00c. to 11.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ¼	30.00c. to 31.00c.

Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	50.25c.
Tin, bar	52.25c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab	7.75c. to 8.00c.
Lead, American pig.....	7.55c. to 7.75c.
Lead, bar	9.75c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade.....	18.75c.
Babbitt metal, high grade.....	54.00c.
Solder, ½ and ¼	31.25c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	15.00c.	16.50c.
Copper, hvy. and wire	14.75c.	16.00c.
Copper, light and bottoms	12.75c.	14.00c.
Brass, heavy	8.50c.	9.50c.
Brass, light	7.50c.	8.50c.
Hvy. machine composition	12.00c.	13.00c.
No. 1 yel. brass turnings	9.75c.	10.50c.
No. 1 red brass or compos. turnings.....	11.25c.	12.25c.
Lead, heavy.....	5.50c.	6.00c.
Lead, tea	4.25c.	5.25c.
Zinc	3.50c.	4.25c.
Sheet aluminum	14.00c.	16.00c.
Cast aluminum	12.25c.	14.25c.

set by an estimate that Straits tin shipments during October will amount to 10,000 tons. If this estimate proves true, a new monthly record will be established. The reaction to this news came in the form of a bad break on the London market, with prices falling to £200 2s. 6d. for spot standard tin, £203 7s. 6d. for future standard, and £204 12s. 6d. for spot Straits. The Singapore market also was adversely affected, with quotations at £210 5s. The unfavorable London situation was reflected today in spot Straits tin at New York, which dropped to 44.25c.

Lead.—Consumers have been placing a fair volume of business for October shipment, but little inquiry has appeared for November delivery. Producers are looking forward to buying on a wider scale later in the month. Prices at St. Louis are steady and unchanged at 6.70c. and the leading interest is maintaining its contract price at 6.90c.

Zinc.—Although purchases have been confined to small tonnages for early delivery, sellers are of the opinion that the market from their standpoint is the strongest in many weeks. This is due partly to the fact that production has been curtailed and partly to the fact that consumers have exceedingly slim stocks on hand and therefore must place some orders soon. In the Tri-State district, 75 per cent of the mines have been shut down the past week. Since the first week of September the weekly output of ore has averaged from 13,000 to 13,500 tons. Sales in the past seven days, at 9820 tons, were about 1000

tons below those of the previous week. Producers are quoting 6.80c., East St. Louis, for prime Western zinc, but at least a small amount is available at a lower figure.

Antimony.—There has been a further recession in prices, with spot metal quoted at 8.50c., New York. Consumers, however, are unwilling to place orders at that figure and are offering 8.25c. The decline in the price of silver, which affects the rate of exchange of the Chinese metal, is largely responsible for the downward movement of quotations.

Nickel.—Ingot nickel is quoted at 35c. a lb. in wholesale lots, shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Oct. 1.—The market started dull in the opening days of the week, but recently sales have mounted to a satisfactory volume. The old metal market is quiet.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 45.75c.; lead, 6.80c.; zinc, 6.90c.; in less-than-carload lots, antimony, 9.60c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No 1, 24.50c.; tin foil, 26c.; block tin, 36c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

be built by Bethlehem Steel Corporation and 1000 by Ralston Steel Car Co.

Great Northern has ordered 14 locomotives from Baldwin Locomotive Works.

New York Central has placed an order with American Locomotive Co. for 42 electric locomotives for use in New York City. Some weeks ago New York Central placed a similar order for 35 locomotives.

Seaboard Air Line has ordered 465 box car bodies from Standard Steel Car Co.

Lehigh Valley has ordered 200 hopper cars from Bethlehem Steel Corporation.

Boston & Maine has ordered 1000 box cars and 500 hopper cars from Standard Steel Car Co.

United Fruit Co. is inquiring for 100 fruit cars and 80 superstructures for fruit cars.

International Railways of Central America are expected to come into the market for 75 stock cars, 50 box cars, 50 flat cars, seven first-class passenger coaches, 15 second-class coaches, three baggage cars and five locomotives.

Chicago & Eastern Illinois has ordered 500 gondola car bodies from Mount Vernon Car & Mfg. Co.

Monongahela Connecting Railroad will buy one to four six-wheel locomotives and one to four eight-wheel locomotives.

Pennsylvania will buy 75 4-8-4 type locomotives.

Chilean State Railway has ordered 17 locomotives from Baldwin Locomotive Works.

It is understood that the Chesapeake & Ohio Railroad will be in the market

shortly for 4000 hopper cars of 57½-ton capacity and 2000 box cars.

Great Northern has ordered three electric locomotives from General Electric Co.

Burlington directors have authorized purchase of 500 automobile, 600 flat, 800 hoppers, 10 baggage, 14 suburban and 10 gas-electric cars; also eight Mikado locomotives and five passenger engines. Authorized for its subsidiary, the Colorado & Southern, are 700 box and 100 flat cars.

Chicago & North Western to Buy New Equipment

WASHINGTON, Oct. 1.—Authority has been granted by the Interstate Commerce Commission to the Chicago & North Western Railroad to issue \$8,775,000 in trust certificates to be used in the purchase of 1000 steel underframe automobile cars, 10 locomotives, 400 steel underframe gondola cars, 15 gas-electric motor passenger-train cars, 300 steel underframe flat cars, 200 steel ballast cars and 10 steel baggage cars. Equipment to be acquired under an agreement made in January consists of 1000 70-ton gondola cars and 25 locomotives.

Application was filed with the commission last week by the Baltimore & Ohio Railroad for authority to issue equipment trust notes of \$13,500,000 to be used as a part of a total of \$18,173,000 for the purchase of equipment, some of which has been ordered or is under negotiation. The equipment includes 2000 70-ton steel gondola cars, 2000 70-ton steel hopper cars, 3500 50-ton all-steel box cars and 50 all-steel passenger coaches.

Merger of Car Builders Said To Be in Progress

Reports are persistent that negotiations are under way for a union between General American Tank Car Corporation and Pullman, Inc. Officials of the two companies refuse to comment on the possibilities of consolidation.

Pullman, Inc., through its subsidiary, the Pullman Car & Mfg. Corporation, has an annual manufacturing capacity of 22,000 freight cars and 1800 passenger cars. The company is also engaged in the manufacture of car wheels and has a large car repair business. More than 8000 parlor and sleeping cars are operated by another subsidiary, the Pullman Co.

General American can produce 18,000 cars annually. The company owns and operates 31,000 tank, refrigerator, milk and special cars. This company has recently expanded by the formation of foreign subsidiaries.

Pullman, Inc., and the General American Corporation, as of Dec. 31, 1928, had combined net working capital of \$80,000,000. Total assets of Pullman were \$305,000,000 and of General American \$56,000,000.

Railroad Equipment

Norfolk & Western Orders 2000 Cars, Boston & Maine 1500

ORDERS for freight cars in the week totaled 3700, of which 2000 are for the Norfolk & Western, 1500 for the Boston & Maine and 200 for the Lehigh Valley. In addition, an unconfirmed report is that the Louisville & Nashville has bought 1000. Orders for nearly 1000 car bodies were placed by two roads.

Locomotive orders included 42 for the New York Central, 17 for the Chilean State Railways and 14 for the Great Northern. The Pennsylvania is inquiring for 75.

With 7000 cars to be bought by the Baltimore & Ohio, probably 6000 by the Chesapeake & Ohio, upward of 2700 by the Burlington, nearly 6000 by the Santa Fe, 4000 by the Southern, and 1900 by the Chicago & North Western, car purchases now definitely in sight total about 30,000 units.

Details of the week's business follow:

Baltimore & Ohio is expected to come into the market soon for 7000 cars.

Louisville & Nashville is reported to have placed orders privately for 1000 cars, but this is not confirmed.

Norfolk & Western has ordered 2000 all-steel hopper cars, of which 1000 will

Fabricated Structural Steel

Structural Steel Activities Maintained at High Level— Awards Total 50,000 Tons

WITH awards of 50,000 tons and fresh inquiries for 54,000 tons, structural steel activities were maintained at a high level in the past week. Contracts placed for work in New York City accounted for almost half of the total lettings. Apartment, office and hotel buildings and other non-industrial structures will require a substantial portion of the aggregate tonnage. However, more than a third of the steel will go into industrial projects.

The largest award was 15,000 tons for a New York office building. Outstanding inquiries are 17,000 tons for two New York subway sections and 12,000 tons for a Chicago office building. Awards follow:

PROVIDENCE, R. I., 100 tons, bridge, to unnamed fabricator.
NEWPORT, R. I., 100 tons, bank, to J. H. Tower Iron Works.
NEW YORK, 15,000 tons, Farmers Loan & Trust Co. Building on William Street, to McClintic-Marshall Co.
NEW YORK, 1500 tons, apartment house at Madison Avenue and Eighty-eighth Street, to George A. Just Co.
NEW YORK, 800 tons, Grasslands Hospital, to Hinkle Iron Co.
NEW YORK, 2600 tons, apartment building at Eighty-first Street and Central Park West, to A. E. Norton, Inc.
NEW YORK, 2800 tons, apartment building at Seventy-first Street and Central Park West, to Harris Structural Steel Co.
NEW YORK, 600 tons, apartment building at 1068 Fifth Avenue, to Easton Structural Steel Co.
PENNSYLVANIA RAILROAD, 400 tons, bridges, to unnamed fabricators.
PHILADELPHIA, 1500 tons, factory for I. Fischman & Sons, to Bethlehem Fabricators, Inc.
ROME, N. Y., 185 tons, New York Central grade crossing elimination, to McClintic-Marshall Co.
BUFFALO, 325 tons, Lasser-Pryor Co. apartment house, to R. S. McMannus Steel Corporation.
QUEBEC, 100 tons, addition to City Hall, to Eastern Canada Steel Co., St. Malo.
SIMCOE, ONT., 2000 tons, plant for American Can Co., to Hamilton Bridge Co.
TORONTO, 100 tons, machine shop for Dominion Wheel & Foundries, Ltd., to John T. Hepburn, Ltd.
POINT MARION, PA., 850 tons, bridge for Point Marion Bridge Co., to Pittsburgh-Des Moines Steel Co.
SAGINAW, MICH., 1965 tons, building for Michigan Bell Telephone Co., to American Bridge Co., reported last week as 1500 tons.
ONTONAGON, MICH., 165 tons, highway bridge, to Milwaukee Bridge Co.
ALEXANDRIA, IND., 400 tons, Banner Rock Products Co., to Indiana Bridge Co.
ANDERSON, IND., 400 tons, National Tile Co., to Indiana Bridge Co.
CHICAGO, 2300 tons, Parker Junior High School, to Hansell-Elcock Co., local.
EAST CHICAGO, IND., 800 tons, highway bridge at Dickey Place, to Wisconsin Bridge & Iron Co.
ELMHURST, ILL., 300 tons, building for Elmhurst Stone Quarry, to Mississippi Valley Structural Steel Co.
MANITOWOC, WIS., 250 tons, addition to city power plant, to Worden-Allen Co.
MANITOWOC, 5000 tons, oil tanker for Standard Oil Co., to Manitowoc Shipbuilding Co.
JANESVILLE, WIS., 750 tons, bridge, to Milwaukee Bridge Co.
ST. PAUL, MINN., 300 tons, airplane hangars, to St. Paul Foundry Co.

TEXAS OIL FIELDS, 3000 tons, storage tanks for Landreth Co., to Chicago Bridge & Iron Co.
AJ0, ARIZ., 500 tons, New Cornelia Copper Co., to Kansas City Structural Steel Co.
OAKLAND, CAL., 185 tons, Heeseman store, to California Steel Co.
CULVER CITY, CAL., 200 tons, stage building for Metro-Goldwyn, to Pacific Iron & Steel Co.
AZUSA, CAL., 850 tons, conveyor frame for work at Azusa dam, to Consolidated Steel Corporation.
STOCKTON, CAL., 100 tons, theater, to Pacific Coast Engineering Co.
EVERETT, WASH., 1650 tons, pulp plant, Puget Sound Timber & Pulp Co., to Isaacson Iron Works.
EVERETT, 1000 tons, plates, boilers, tanks and digesters for Puget Sound Timber & Pulp Co., to Puget Sound Machinery Depot.
TACOMA, WASH., 150 tons, hangar, to unnamed bidder.
BREMERTON, WASH., 200 tons, plates for pipe line, to unnamed bidder.
SEATTLE, 400 tons, six locomotive boilers for Great Northern Railroad, to Puget Sound Machinery Depot.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 200 tons, banking house addition and alterations.
PITTSFIELD, MASS., 150 tons, school.
SPRINGFIELD, MASS., 125 tons, Court House.
NEW YORK, 17,000 tons, subway work: 12,000 tons for section 110, route 107, and 5000 tons for section 3, route 110.
NEW YORK, 1000 tons, public school No. 105 in Bronx.
NEW YORK, 2500 tons, Merchants Square Building at Church and Thomas Streets.
BROOKLYN, 850 tons, building for *Brooklyn Times*.
SCHENECTADY, N. Y., 500 tons, City Hall.
PENSACOLA, FLA., 2500 tons, bridge.
BUFFALO, 800 tons, *Courier-Express* Building.
OTTAWA, ONT., 3500 tons, second block of Government building; Department of Public Works to call for bids during winter.
DETROIT, 1000 tons, building for Detroit Edison Co.
DETROIT, 1500 tons, addition to *Detroit News* Building.
INDIANA HARBOR, IND., 325 tons, bar mill for Inland Steel Co.
CHICAGO, 12,000 tons, estimated, office building for Marshall Field Estate.
CHICAGO, 300 tons, addition to armory.
CHICAGO, 750 tons, addition to 124th Field Artillery Armory.
ST. PAUL, MINN., 400 tons, safety building.
ST. LOUIS, 4500 tons, Merrimac River bridge for Missouri Pacific Railroad.

NORTH BEND, ORE., 400 tons, power house.
LONG BEACH, CAL., 970 tons, auditorium.
SACRAMENTO, CAL., 405 tons, Trinity River bridge; Mercer-Fraser Co., Eureka, low bidder.
SACRAMENTO, 1337 tons, bridge over San Luis Rey River; bids Oct. 16.
SAN FRANCISCO, 350 tons, warehouse for Western Sugar Refinery Co.; bids being received.
SANTOS, BRAZIL, 400 tons, building for Phoenix Utility Co.

U. S. Steel Officials Visit Columbia Properties

SAN FRANCISCO, Sept. 30.—United States Steel Corporation officials, including James A. Farrell, president, and Myron C. Taylor, chairman of the finance committee; E. J. Buffington, president, and T. W. Robinson, vice-president, Illinois Steel Co.; Gordon G. Crawford, president, Tennessee Coal, Iron & Railroad Co.; E. W. Pargny, president, and W. A. Irvin, vice-president, American Sheet & Tin Plate Co., and John S. Keefe, president, and C. F. Blackmer, general superintendent in charge of operations, American Steel & Wire Co., are on a visit of inspection of the properties of the Columbia Steel Corporation at Pittsburg, Cal., and at Provo, Utah.

In San Francisco, Mr. Farrell told newspaper correspondents that their visit was in connection with the pending sale of the Columbia Steel Corporation to the United States Steel Corporation, but that "it was a little too early to discuss the outcome."

The United States Steel Corporation took a 90-day option on the Columbia properties while Mr. Farrell was in Europe recently.

Milling Machine Company Holds Sales Conference

More than 165 persons, representing many foreign countries and every State in the union, gathered on Sept. 27 at an international sales conference at the plant of the Cincinnati Milling Machine Co., Cincinnati. Approximately 12,000 ft. of floor space in one of the company's new buildings was converted into a theater, where each new machine to be demonstrated at the Cleveland show was exhibited to sales representatives. In addition to the display, papers on various subjects pertaining to machine tool manufacture and sales were read.

Hickman, Williams & Co., Inc., 1607 Oliver Building, Pittsburgh, has been appointed exclusive distributor of Clairton nut coke for domestic use. The domestic coke department will be in charge of M. M. Griest, former president of the Pittsburgh-Cambridge Coal Co., Pittsburgh, which has retired from business.

Study of Iron Alloys Started

Committee of Metallurgists Organizes to Carry Out Research of Engineering Foundation

IT was announced by H. Hobart Porter, chairman of the Engineering Foundation, at a dinner at the University Club, New York, on Wednesday evening, Sept. 25, that Dr. George B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, will head the Iron Alloys Committee of the foundation.

With the cooperation of industries, engineering societies, universities, and the United States Government, the committee will inaugurate a program of cooperative research called vital to the progress of the American iron and steel industry, whose future, it was declared, will be greatly affected by its ability to maintain a strong position in alloy irons and alloy steels.

The research, the initial stage of which will require five years and cost \$150,000, will, it is planned, develop as an international enterprise, coordinating researches in ferrous metallurgy, the most important of which, according to engineers, are going on in America, England and Germany.

Other members of the committee, who will at once begin a critical review of all available literature in English and other languages, resulting in a series of monographs and manuals, were named as follows:

Dr. George K. Burgess, director of the United States Bureau of Standards; Louis Jordan of the bureau, alternate, Washington.

Scott Turner, director of the United States Bureau of Mines; Dr. Charles H. Herty, Jr., alternate, Pittsburgh.

R. E. Kennedy, technical secretary of the American Foundrymen's Association, Chicago.

Dr. H. W. Gillett, director of the Battelle Memorial Institute, Columbus, Ohio.

Prof. Bradley Stoughton, director of the metallurgical engineering department of Lehigh University, South Bethlehem, Pa.

Jerome Strauss, chief research engineer of the Vanadium Corporation of America, Bridgeville, Pa.

T. H. Wickenden, metallurgical engineer of the International Nickel Co., New York.

Dr. John A. Mathews, vice-president of the Crucible Steel Co. of America, New York.

The Iron Alloys Committee, said Mr. Porter, who is president of the American Water Works & Electric Co., will work in cooperation with the American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Society of Civil Engineers, American Institute of Electrical Engineers, American Iron and Steel Institute, Society of Automotive Engineers, American Society for Steel Treating, American Society for Testing Materials, United States Bureau of Standards, United States Bureau of Mines, numerous corporations in the metallurgical industries and several

universities. There are encouraging indications, he added, that foreign cooperation also may be arranged. He also is quoted as saying:

The subject of this committee's work is basic data on iron and its very numerous combinations with other metals and certain metalloids. Extensive as is the use of iron in this "Iron Age," very few persons have ever seen absolutely pure iron. Many thousands of tons of nearly pure iron are used annually for a variety of purposes.

By far the larger proportion, however, of the iron used in the arts is combined with other substances. First are the millions of tons of carbon steels for frames of buildings, for the plates of ships, boilers, tanks and pipes, for rails, in the steam and electric railroads, and for multitudinous other things. Iron castings account for many other thousands of tons. Our industries and engineers have scarcely more than begun to apprehend the possibilities of alloy irons and alloy steels. Nevertheless, progress has been rapid in recent years. Much more information is needed by both producers and users.

The Iron Alloys Committee consequently has accepted as its first duty the very large task of culling from the voluminous literature the essence of useful knowledge and putting it into forms convenient for use by researchers, technologists, engineers and superintendents. Repeatedly, foremost

technical leaders in the industries and research institutions have urged this work as the greatest possible aid which the Engineering Foundation, on behalf of the engineering societies, could give to the progress of the iron, steel and related industries in developing alloy irons and alloy steels.

As the second part of its undertaking, the Iron Alloys Committee will aid, promote and organize researches for new basic information about pure iron and its combinations with other substances. It will not attempt to discover or devise commercial alloys; that is the business of the laboratories in the industries. Rather the committee will seek those underlying facts which will be necessary to all the industrial metallurgical laboratories. To conduct this extensive and important project, a committee of distinguished metallurgists has been selected from the several sectors of the field.

Among guests at the dinner, in addition to the members of the committee, there were:

Dr. Edward Dean Adams, honorary member of the foundation; Alva C. Dinkey, president of the Midvale Co.; J. V. N. Dorr, president of the Dorr Co.; Alfred D. Flinn, director of the Engineering Foundation; Dr. Arthur D. Little, president of the Arthur D. Little Co., Cambridge, Mass.; Roy V. Wright, managing editor of *Railway Age*; H. Foster Bain, secretary of the American Institute of Mining and Metallurgical Engineers; Dr. F. M. Becket, vice-president of the Union Carbide Co.; E. A. S. Clarke, secretary of the American Iron and Steel Institute; Calvin W. Rice, secretary of the American Society of Mechanical Engineers; J. V. W. Reynders, consulting engineer, New York.

Reinforcing Steel

Awards Total 5800 Tons—New Jobs Will Take 4200 Tons

CONTRACTS for reinforcing steel bars placed in the past week totaled 5800 tons. Twenty-five hundred tons will go into the construction of the New York State prison at Attica and 1100 tons into a department store at Dubuque, Iowa. Fresh work which came out in the last seven days totals 4200 tons. The largest job is a highway bridge at Portland, Ore., taking 2000 tons. Awards follow:

ATTICA, N. Y., 2500 tons for Attica State Prison, reported placed with Bourne-Fuller Co.

NEW YORK CENTRAL RAILROAD, 115 tons, 241st Street viaduct in New York, to Joseph T. Ryerson & Sons, Inc.

NEW YORK, 250 tons, New York Hospital, to Carroll-McCreary & Co., Inc.

BROOKLYN, 200 tons, post office extension, to Joseph T. Ryerson & Sons, Inc.

PHILADELPHIA, 400 tons, hospital for Women's Medical College, to Roslyn-Gilmore Steel Co.

CHICAGO, 400 tons, apartment building at Fifty-Second Street and Blackstone Avenue, to Inland Steel Co.

CHICAGO, 160 tons, addition to Prairie Farmer Building, to an unnamed bidder.

NOTRE DAME, IND., 400 tons, stadium for Notre Dame University, to Olney J. Dean & Co.

PEORIA, ILL., 100 tons, building for St. Francis Convent, to Laclede Steel Co.

DUBUQUE, IOWA, 1100 tons, department store, to unnamed bidder.

SAN DIEGO, CAL., 100 tons, Army-Navy Academy, to unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BUFFALO, 240 tons, *Courier-Express* Building.

AKRON, OHIO, tonnage unstated, seven-story building for Firestone Tire & Rubber Co.

AKRON, tonnage unstated, Mayflower Hotel.

AKRON, 800 tons, Polsky department store.

WILMINGTON, DEL., 500 tons, hospital and nurses' home.

CHICAGO, tonnage unstated, addition to Washington Park Armory.

CHICAGO, 350 tons, addition to Michael Reese Hospital.

RIVER FOREST, ILL., tonnage unstated, building for Bowman Dairy Co.

SPRINGFIELD, ILL., tonnage being estimated, 25 institutional buildings for State of Illinois.

OLYMPIA, WASH., 170 tons, Thurston County Court House; bids being received.

PORTLAND, ORE., 2000 tons, approaches to St. John's River bridge; bids opened.

SACRAMENTO, CAL., 128 tons, bridge over San Luis Rey River; bids Oct. 16.

PERSONAL

FREDERICK A. GEIER, president of the Cincinnati Milling Machine Co., was the guest of honor at a dinner in Cincinnati Saturday night, which was the climax of a three-day international sales conference of the Milling Machine company and its subsidiary, Cincinnati Grinders, Inc. Representatives of the company from all over the world, as well as from



F. A. GEIER

every State in the Union, together with leading members of the machine tool industry in Cincinnati, attended the dinner. Wallets with the name of each guest in gold letters served as place cards. Each guest also was given a recent photograph of Mr. Geier inclosed in a brochure entitled "Forty-Five Years," which contained a complete history of the Cincinnati Milling Machine Co., from 1884 to the present time. Speakers at the dinner included Henry Prentiss, New York, who was introduced as the "dean of the dealers", and Sol Einstein, chief engineer of the company. During the dinner George Merryweather, president of Motch & Merryweather, Cleveland, which has represented the company for 25 years, was presented with a bouquet of flowers to celebrate the company's twenty-fifth anniversary. Philip O. Geier, president of Cincinnati Grinders, Inc., was toastmaster.

H. M. LANE, president, H. M. Lane Co., industrial engineer, Detroit, has recently removed his office to Gray Gables, East River Drive, Grosse Ile, Mich.

MAURICE G. STEELE, director and development engineer of the Hart & Hutchinson Co., New Britain, Conn., has resigned to become manager of the Rome-Turney Radiator Co., Rome, N. Y. He has been active for years in the American Society of

Mechanical Engineers, New Britain section, of late serving as vice-chairman of that body.

MAURICE E. BROWN, formerly foreman of the Union Malleable Iron Co., East Moline, Ill., has resigned to join the sales department of the Arcade Mfg. Co., Freeport, Ill., maker of hardware specialties and molding machines.

GUS A. SMITH, who started in 1906 in the foundry of the Simmons Co., Kenosha, Wis., has recently been named general manager of the Wisconsin plant, succeeding D. C. TRAVIS. From foundry foreman Mr. Smith was advanced to various posts and in 1922 became assistant general manager.

SAMUEL M. VAUCLAIN, chairman of the board of the Baldwin Locomotive Works, Philadelphia, addressed the Cleveland Engineering Society, at a dinner meeting Oct. 1, on "Business Requirements of Engineers in Industry." This was the first meeting on the society's program for the year.

RICHARD E. BROCK has been appointed chief engineer and master mechanic at the Etna, Pa., plant of Spang, Chalfant & Co., Inc., Pittsburgh, succeeding R. G. CONNELL, who resigned recently.

G. H. HEDRICK, vice-president, Thomas Spacing Machine Co., Glenshaw, Pa., has resigned.

H. E. PARKER, superintendent machinery division, Peck, Stow & Wilcox Co., Southington; F. G. HOUSMAN, factory superintendent, P. & F. Corbin Mfg. Co., New Britain; H. S. WASHBURN, Plainville Casting Co., Plainville; EDGAR SPENCER, Philbrick, Booth & Spencer, Hartford; P. W. SPENCER, Bradley & Hubbard Mfg. Co., Meriden; and CHARLES S. PARKER, Charles Parker Co., Meriden, have been appointed members of the advisory committee on foundry training in northern Connecticut to cooperate with the State Board of Education in bringing about closer relationships between the State trade schools and industries in that section.

D. M. AVEY, editor of *Foundry*, will address the Oct. 3 meeting of the Chicago Foundrymen's Club at the City Club, Chicago, on "Value of District Foundry Associations and General Foundry Progress."

RUDOLPH NELSON has been added to the Chicago branch staff of the United States Electrical Tool Co., Cincinnati.

FREDERICK E. GROSS, who has represented the pig iron department of the Donner Steel Co., Inc., Buffalo, in central and eastern New York, has resigned.

R. G. GUTHRIE, metallurgist, Peoples Gas Light & Coke Co., Chicago, is to speak on "Metallurgy for the Shop Man" at a dinner meeting of the Tri-City chapter of the American Society for Steel Treating at the Davenport Chamber of Commerce, Davenport, Iowa, Oct. 8. He was nominated president of the national



R. G. GUTHRIE

society at the annual convention, Sept. 9 to 13, and will take office Jan. 1.

PAUL J. KRUESI, president, Southern Ferro Alloys Corporation, Chattanooga, Tenn., has been elected president of the East Tennessee Coal & Iron Co., Knoxville, Tenn., succeeding the late SEN. LAWRENCE D. TYSON. Mr. Kruesi has been vice-president of the company for a number of years.

SCOTT TURNER, director of the United States Bureau of Mines, will sail from San Francisco, Oct. 10, to attend the World Engineering Congress at Tokio. He was appointed by President Hoover as one of the five Federal engineers who are to represent the United States Government at this congress. Mr. Turner also holds a commission to represent the American Committee of the World Power Conference, and is listed as a member of the official party representing the American Institute of Mining and Metallurgical Engineers. He plans to return to the United States the latter part of November.

J. HARVEY BRYAN, who represents the Apollo Steel Co., Apollo, Pa., and the Gulf States Steel Co., Birmingham, Ala., in New York, has been appointed New York district sales representative for Bliss & Laughlin, Inc., Harvey, Ill., maker of cold-drawn steel.

OBITUARY

C. F. SCHERER, superintendent, Davenport Machine & Foundry Co., Davenport, Iowa, was elected chairman of the Tri-City Technical Council at a meeting held at the LeClaire Hotel, Sept. 20. HOWARD ROGERS, assistant treasurer, Williams, White & Co., Moline, Ill., was elected vice-chairman. E. C. XANDER, assistant secretary, Tri-City Manufacturers' Association, Moline, is the new secretary, and MAX SKLOVSKY, Deere & Co., Moline, continues as treasurer.

GEORGE D. KINGSLAND, who has been associated for many years with the Minneapolis-Honeywell Regulator Co., Minneapolis, has been placed in charge of the unit heater control division of the company.

EDWARD R. YOUNG, formerly research engineer of the Detroit Steel Casting Co., has joined the staff of the Climax Molybdenum Co., New York, as metallurgical engineer. He was graduated from the University of Michigan in 1915 and later specialized in foundry research as holder of an industrial fellowship in metallurgy.

JOSEPH JACOBSON has been added to the staff of the Goodell-Pratt Co., Greenfield, Mass., to handle sales in Michigan, with headquarters at 205 South Marlborough Street, Detroit. JOHN H. METZ, Richmond Hill, L. I., has taken over the territory formerly assigned to E. C. MESLOH, and the F. J. Keller Co., Capps Building, Dallas, Tex., has been appointed to take care of sales in Texas, Oklahoma, Louisiana and Arkansas.

RALPH MODJESKI, of Chicago, has been awarded the John Fritz medal "for notable achievement as an engineer of great bridges."

C. K. EVERITT, managing director and general manager of Edgar Allen, Ltd., Sheffield, England, was given a testimonial luncheon by FRITZ J. FRANK, president, The Iron Age Publishing Co., and C. S. BAUR, advertising manager, THE IRON AGE, on Sept. 26 at the Union League Club, New York. Others who were present were H. S. HOYT, president; J. KING HOYT, JR., secretary and treasurer; V. A. GREENE, vice-president and general manager, and W. A. METZE, assistant treasurer, respectively, of the Edgar Allen Steel Co., Inc., New York; F. W. ECKER, assistant treasurer, Metropolitan Life Insurance Co., New York; and GIFFORD LE-CLEAR, member of the firm of Densmore, LeClear & Robbins, architects and engineers, Boston. Mr. EVERITT sailed for England on the Franconia, Sept. 28.

G. H. CHARLS, president, National Association of Flat Rolled Steel Manufacturers, Cleveland, spoke on "Building the Family Spirit in Industry" at the opening of a three-day convention and exhibit, Sept. 30, of the National Industrial Advertisers' Association.

H. COLE ESTEP, vice-president of the Penton Publishing Co., Cleveland, and prominent in the affairs of the American Foundrymen's Association, of which he had been a director the past year, died suddenly of heart disease Sept. 30, aged 43 years. He had been chairman of the committee



H. COLE ESTEP

on international relations of the American Foundrymen's Association for several years and it was largely through his efforts that the plan was adopted of having exchange papers between that association and European foundry societies. Mr. Estep was born in Stampede Tunnel, Wash., and was graduated as a mechanical engineer from the University of Minnesota in 1908. That year he joined the editorial staff of the *Iron Trade Review*, which he represented in Seattle and later in Chicago. In 1914 he became engineering editor of that publication, which position he held for three years. He was editorial director of the various Penton publications in 1918 and 1919 and European manager of these publications from 1919 to 1924. Mr. Estep was secretary of the Foundry Equipment Manufacturers' Association, member of the American Iron and Steel Institute, American Society of Mechanical Engineers, Institute of British Foundrymen, Engineers' Club of London, (British) Iron and Steel Institute, and Association Technique de Fonderie de France.

GEORGE W. GILBERT, vice-president, A. Gilbert & Sons Brass Foundry Co., St. Louis, died there recently, aged 58 years. He was born in St. Louis, and soon after his graduation from high school entered the employ of his father, A. Gilbert, who founded the institution which bears his name.

MORRIS BLOCK, president, M. N. Block Co., manufacturer of sheet metal products, Chicago, died re-

cently of a fractured skull, following a fall in the bathroom of his home.

LOUIS VAUGHAN HUBBARD, president, Taft-Peirce Co., manufacturer of tools, dies and engineering instruments, Woonsocket, R. I., died of acute indigestion at his home in Montclair, N. J., Sept. 26, aged 63 years.

WALTER CHARLES WHITE, aged 52 years, president of the White Motor Co., Cleveland, died Sept. 29 from effects of injuries received in an automobile accident. He was graduated from Cornell University in 1898 and had been identified with the automotive industry since its early days. He was president of the White Co., the sales organization of the White Motor Co., a director of Bishop & Babcock Mfg. Co., Cleveland, and other companies.

Expect Gain in Shipments Over 1928 Last Quarter

WASHINGTON, Oct. 1. — Carload shipments of iron and steel during the fourth quarter of the year are expected by the Shippers' Regional Advisory Boards to total 522,943, or an increase of 5.4 per cent over the 496,038 carload shipments last year.

Machinery and boiler carload shipments are fixed at 54,391, an increase of 5.6 per cent over the 51,485 cars shipped during the last quarter of 1928. Coal and coke carload shipments are estimated at 3,079,509, an increase of 6.1 per cent over the 2,902,992 cars shipped for the corresponding period of last year. Ore and concentrate shipments estimated to require 472,053 cars, an increase of 3.1 per cent over the 457,907 cars for the final quarter of last year.

For the entire 29 commodities considered in the survey made by the Regional Advisory Boards, it is estimated that fourth quarter requirements will be about 9,134,023 cars, an increase of 2.3 per cent or 209,391 cars above the corresponding period of 1928, according to the Car Service Division of the American Railway Association.

Laconia Car Co. Drops Car Building Work

Laconia Car Co., Laconia, N. H., has definitely decided to discontinue the manufacture of street and railroad coaches. Several months ago, the management, following the failure of the company to secure certain Boston & Maine Railroad work, announced it was to discontinue operations, but such action was deferred. The Laconia plant has not been an important factor in the car building industry for three years. It will now devote its activities to power boat production.

Wholesale Prices Decline In August

Prices of commodities reported upon by the United States Bureau of Labor Statistics showed a fractional decline in August from the level of July, being 97.7 against 98, both referred to the average of 1926 is 100. Comparison shows 98.9 for August, 1928. Practically all of the 10 major items showed fractional changes.

Metals and metal products went down to 104.3, compared with 105 in July, owing partly to a decline in the iron and steel component from 97.9 to 97.6 and partly to a decline in automobile figures from 112.2 to 110.7. Non-ferrous metals, agricultural implements and other metal products did not change. Structural steel, one of the elements in the building material group, remained stationary at 99.6.

8-Month Automobile Output Near 12-Month Record

WASHINGTON, Sept. 21.—Making a decline of only 764, the August production of motor vehicles in the United States was 499,629 units, against 500,393 in July, according to the Department of Commerce. The output of passenger cars, however, increased by 17,553 units, rising to 443,714 from 426,159. Production of trucks decreased by 18,262 to 54,918 from 73,180, while there was a drop of 57 units in the production of taxicabs, the August total being 997 as against 1054 in July.

Canadian production of motor vehicles in August was 14,214, a drop of 3247 from the 17,461 produced in July and little more than one-third as much as in April last. The output of passenger cars was 11,037, a drop of 2563 from the 13,600 produced in July, while the truck production was 3177, a decline of 684 from the 3861 produced in July.

Production Increased

For the first eight months motor vehicles to the number of 4,223,414 were produced in the United States, an increase of 1,168,509 over the production of 3,054,905 for the corresponding period of last year. Passenger car production for the 1929 eight-month period increased to 3,-

642,211, a gain of 940,888 over the 2,701,323 produced during the corresponding period of 1928. Truck production increased by 218,979 units, rising to 568,519 from 349,540, and exceeding the 530,910 made in all of 1928, which itself was a record. Taxicab output was 12,684 for the first eight months, against 4042 during the corresponding period of last year, an increase of 8642.

Only three complete years have shown total output exceeding that for eight months this year: 1928, with 4,358,759 units; 1926, with 4,300,934; and 1925, with 4,265,830. At the August rate, 10 days of September's production would put the total ahead of any previous full year.

Canadian production of motor vehicles for the first eight months of 1929 was 220,036, compared with 181,459 during the corresponding period of last year, an increase of 38,577. Passenger car production was 176,250 against 152,265, an increase of 23,985. Truck output was 43,786 compared with 29,194, a gain of 14,592; it almost reached the 45,641 total for all of 1928.

Many More Portable Tools Exported

WASHINGTON, Sept. 28.—Foreign demand for American portable tools has been steadily expanding during the past few years and in 1928 sales exceeded \$1,700,000, according to L. J. Cochrane, Industrial Machinery Division, Department of Commerce. Exports of last year, 33 per cent greater than those of 1926 and 47 per cent more than those of 1925, reflected a substantial gain over those of 1927.

During the first seven months of 1929 exports of portable tools were valued at \$1,240,000, against about \$920,000 for the like period of last year.

Shipments in 1928 went to more than 60 countries, the United Kingdom being the heaviest buyer, taking \$465,000 worth, or 27 per cent of the total, but it was indicated that a considerable quantity was reexported. Japan was the next largest buyer, taking 15 per cent of all. Canada also was a large buyer, as was France, which took American portable tools to the value of \$167,000.

Tin Exports from Malaya Are Increasing

WASHINGTON, Sept. 21.—Exports of tin from Malaya for the first six months of 1929 was 50,095 tons, while in the full year 1928 the total was 99,052 tons, valued at \$109,028,000, or about 57 per cent of the world production, according to a report received from John H. Bruins, American consul at Singapore. Of the 1928 exports from Malaya, shipments to the value of \$62,659,416 went to the United States. Total exports in 1927 were 83,773 tons and in 1926 they were 76,334 tons.

Philippine Steel Imports Up One-Half in 2 Years

WASHINGTON, Sept. 21.—Of 129,491 metric tons of iron and steel imported into the Philippine Islands in 1928, the United States provided 84,939 tons or 65.6 per cent, and Belgium 25,146 tons, according to a statement prepared by J. Joseph W. Palmer, Iron and Steel Division, Department of Commerce. In 1927 imports were 105,009 tons, of which 63,064 tons or 60 per cent came from the United States, 18,131 tons from Belgium and 13,539 tons from Germany. The 1926 imports totaled 86,727 tons, of which 55,742 tons or 64.3 per cent came from the United States, 13,198 tons from Germany, 10,874 tons from Belgium and 3850 tons from the United Kingdom. Largest items in 1928 were corrugated roofing sheets, 24,382 tons; railroad track material, 21,019 tons, steel bars or rods, 16,577 tons; and pipes and fittings. Of the corrugated roofing sheets imported, 24,056 tons came from the United States. America furnished 9882 tons of railroad track material; Belgium, 7719 tons; and Germany, 2348 tons. The United States supplied 12,638 tons of the imports of pipe and fittings.

Open-Hearth Capacity of Polish Mill Doubled

HAMBURG, GERMANY, Sept. 16.—The Friedenshütte A. G., Friedenshütte, Upper Silesia, Poland, the only important Polish steel plant in which American capital is not invested, has reorganized and expanded its capacity. The company has added six open-hearth furnaces, which will raise its output from 150,000 tons a year to more than 300,000 tons. Five of the furnaces are now in operation and the sixth, a 60-ton furnace, will be lighted in October.

A pamphlet entitled "Practical Aspects of Resuscitation" has been written by Edward Steidle, Dean of the School of Mines and Metallurgy, Pennsylvania State College, and published by Mine Safety Appliances Co., Pittsburgh.

Production and Shipment of Raw Materials and Finished Products

	August, 1929	July, 1929	August, 1928
By-product coke, net tons(a).....	4,642,785	4,613,723	3,994,924
Beehive coke, net tons(a).....	561,800	600,200	287,700
Total coke, net tons(a).....	5,204,585	5,213,923	4,282,624
By-product daily average(a).....	149,767	148,830	128,869
By-product, eight months(a).....	35,950,237(b)	.....	31,577,542
Electric industrial trucks and tractors(c).....	152	168	96
Electric industrial, eight months(c).....	1,423	.....	1,466
Steel barrels produced(d).....	806,574(e)	790,175	677,313
Steel barrels produced, eight months.....	5,847,773(b)	.....	5,033,749
Steel barrels shipped(d).....	809,860(e)	782,411	675,600
Steel barrels shipped, eight months.....	5,837,538(b)	.....	5,028,811
Unfilled orders, end of month(d).....	1,205,659	1,372,697	1,064,358

(a) United States Bureau of Mines.

(b) New high record for first eight months of any year.

(c) Number shipped: figures from Department of Commerce.

(d) Department of Commerce.

(e) Second highest total for any month.

Expansion in European Steel Mills

Several New Units in Operation—Pig Iron Prices Strong in Britain
—Manganese Ore Plentiful—Italians Form Steel Cartel

(By Cable)

LONDON, ENGLAND, Sept. 30.

COKE prices are still advancing and sellers of Durham furnace coke are now asking 23s. 6d. (\$5.70) per ton. Consequently pig iron prices are firm and Cleveland makers' quotations are unchanged. Midland furnaces, however, have advanced quotation 2s. 6d. (60c.) a ton on all grades.

Domestic demand is strong and good sales have been effected, but export is quiet, although inquiry is improving. Hematite iron is rather more active, but makers are not keen sellers at present prices, and some furnaces are piling their output in preference to selling.

Finished steel is generally quiet. The steel makers' association has reaffirmed prices, but advances are still being considered on the basis of increasing costs. Certain plate mills are well occupied while others, lacking orders for shipbuilding material, are seeking tonnage. Clyde launchings in September were 10 vessels of 28,000 tons, gross register.

Sales of Continental material here are dull despite declining prices. The International Steel Cartel has been prolonged until March 31, 1930, on the present basis. The International Rail Makers Association has reaffirmed prices.

Tin plate prices are strong as a result of sustained demand from consumers the world over buying for first quarter shipment at 19s. (\$4.60)

per base box, f.o.b. works port for large lots and 19s. 3d. (\$4.66) per base box for small lots.

Galvanized sheet demand is slightly better, but mills are still in need of orders. Black sheets continue quiet.

The Ebbw Vale Steel, Iron & Coal Co. has issued notice of suspension to all iron and steel workers, about 4000 in all being affected. The chairman of the board states that foreign competition is the reason for closing the plant.

Luxemburg production in August was 252,000 metric tons of pig iron and 238,000 tons of raw steel. There

were 38 furnaces in blast at the end of August.

Polish output in August was 65,000 metric tons of pig iron, 111,000 tons of raw steel and 80,000 tons of rolled steel.

The Saar output in August was 182,000 tons of pig iron and 192,000 tons of raw steel.

Russian output in August was 347,000 metric tons of pig iron, 400,000 tons of raw steel and 310,000 tons of rolled steel.

The Friedrich Krupp A. G., Essen, Germany, has laid off 1000, and the Rheinmetall A. G., 800 men.

British Pig Iron Prices Are Strong

Furnaces Still Claim Costs Leave Little Profit—Steel Market Quiet Except in Tin Plate

LONDON, ENGLAND, Sept. 17.—Business has not revived to any extent since the holiday period, but indications are that improvement will not be long delayed. Demand for pig iron has been consistently good during the past few months, and it appears that a considerable period of activity will ensue. With Continental iron no longer competitive in the British market, Cleveland furnaces are well engaged with domestic orders and have disposed of most of their October production. Scarcity and high cost

of fuel still prevent a substantial increase in output, but the number of furnaces in blast has increased steadily since May to the present total of 170, the largest since July, 1927.

Although Cleveland No. 3 foundry iron is at £3 12s. 6d. (\$17.58) per ton, producers still complain that the margin of profit is too small. Hematite makers also seek higher prices, but each increase jeopardizes foreign business, which is most important to the hematite industry. Costs are in-

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp with the £ at \$4.85

British Prices, f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3 12½s.	to £3 13½s.	\$17.58	to \$17.82
East Coast hematite...	3 16½	to 3 17	18.51	to 18.63
Perromanganese, export	13 10	to 14 0	65.47	to 67.90
Billets, open-hearth...	6 5	to 6 7½	30.31	to 30.92
Sheet bars, open-hearth	6 5	to 6 10	30.31	to 31.52
Black sheets Japanese specifications	12 12½		61.22	
Tin plate, per base box	0 19	to 0 19½	4.60	to 4.66
Rails, 60 lb. and heavier	7 15	to 8 15	37.59	to 42.43
Steel bars, open-hearth	7 15	to 8 10	1.67	to 1.84
Beams, open-hearth...	7 2½	to 7 12½	1.55	to 1.65
Channels, open-hearth...	7 7½	to 7 17½	1.60	to 1.71
Angles, open-hearth...	8 2½	to 8 12½	1.76	to 1.86
Ship plates, open-hearth	7 12½	to 8 2½	1.66	to 1.76
Black sheets, No. 24 gage	10 5	to 10 10	2.21	to 2.27
Galvanized sheets, No. 24 gage	13 7½	to 13 10	2.89	to 2.92

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3 7s.	to £3 10½s.	\$16.24	to \$17.09
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3 7	to 3 10	16.24	to 16.97
Billets, Thomas...	4 14	to 4 14½	22.79	to 22.91

Sheet bars, Thomas...	4 17½	to 5 0	23.64	to 24.25
Wire rods low C., No. 5 B.W.G.	6 5	to 6 6¼	30.30	to 30.61
Black sheets, No. 31 gage, Japanese...	12 7½		60.02	
Rails, 60 lb. and heavier	6 8½	to 6 10*	31.16	to 31.52
Rails, light...	6 1½		29.46	
Steel bars, merchant...	5 9½	to 5 10	1.18	to 1.19
Steel bars, deformed...	5 8½	to 5 9	1.17	to 1.18
Beams, Thomas, British standard	5 0	to 5 4½	1.10	to 1.15
Channels, Thomas, American sections...	5 14	to 5 18	1.24	to 1.27
Angles, Thomas, 4-in. and larger, over ¾-in. thick	5 4		1.13	
Angles, Thomas, 3-in.	5 12		1.21	
Ship plates, open-hearth inspected	7 8		1.63	
Hoop and strip steel over 6-in. base...	5 13	to 5 15	1.22	to 1.24
Wire, plain, No. 8 gage	7 4	to 7 5	1.58	to 1.59
Wire, galvanized, No. 8 gage	9 3	to 9 4	1.99	to 2.02
Wire, barbed, 4-pt. No. 12 B.W.G.	11 12½		2.58	
Wire nails, base...	7 10	to 7 10½	\$1.62	to \$1.63 per keg
Wire nails, assortments, 1 to 6-in. keg	10 6¼		2.23	

*Open-hearth steel, 10s. (\$2.42) per ton extra.

creasing, and it has been suggested that certain furnaces may be forced to suspend.

Finished iron and steel is still under the influence of the holidays. Inquiry is increasing, but the volume of new business is small, especially in heavy plates, as new tonnages from shipyards are slow to mature. Most of the shipyards are moderately well engaged, but there is little new tonnage to replace the old contracts being completed. The sheet market is

quiet, but tin plate is active, with fall demand developing. Prices are strong, with a rising tendency, and mills are well sold ahead on the basis of restricted output. Overseas users are beginning to inquire for their 1930 requirements.

The recent report of the merger of Bolckow-Vaughn & Co. with Dorman, Long & Co., with a combined capital of about £20,000,000 (\$97,000,000) has not been confirmed by any official statement from either company.

Italian Steel Cartel Is Formed

Includes 95 Per Cent of Producers—Not Expected to Affect Decision to Remain Out of International Cartel

ROME, ITALY, Sept. 13.—An Italian steel syndicate, which embraces about 95 per cent of the country's capacity, has been formed at the suggestion of the Government. A partial syndicate was established about one year ago, being organized as a stock corporation under the name of the Conzorzio Italiano delle Acciaierie e Ferriere. This syndicate included 16 corporations, which account for about two-thirds of the total national production. However, an important group, the Acciaierie e Ferriere Lombarde of Milan, refused to become a member and competition remained severe in the domestic market. This latter corporation has joined the new syndicate, and a more orderly market and rationalization of production are expected.

The steel industry of the country has 120 open-hearth furnaces and 60 electric furnaces with a total rated capacity of about 3,000,000 tons a year. Annual output, however, has never reached 2,000,000 tons. Production is spread over 40 steel works, and some of the minor companies produce less than 20,000 tons a year. Prices are high, partly because of uneconomic methods in some plants and partly on account of the general competition for supplies of raw material. With the new syndicate functioning, it is planned to buy all raw materials for members through a joint purchasing organization.

Each member company of the syndicate will be allotted a quota on the basis of its output of products and its rated capacity. It is believed that domestic prices will be advanced, and in some quarters increases of as much as 100 lire per ton are considered necessary. Italy's steel production was only 933,000 metric tons in 1913, but reached a high of 1,785,500 tons in 1925, after which it declined to 1,779,500 tons in 1926 and 1,591,500 tons in 1927. The total in 1928 was 1,692,632 tons.

Establishment of the syndicate is not expected to affect Italy's decision to remain outside the International Steel Cartel, since Italian production is claimed to be almost exclusively for domestic use. The pre-war syndicate of steel producers in Italy had

certain relations with the pre-war German Stahlwerksverband, governing importation by Italy of German semi-finished material, structural shapes and rails, but the agreement was not renewed after the war.

Cartel Is Provisionally Renewed

(By Radio)

BERLIN, GERMANY, Sept. 30.

THE International Steel Cartel has been renewed provisionally until the end of March. No decisions were reached at the cartel meeting on the questions in dispute among the member countries, but prospect of a definite renewal is considered better. Production quotas of the cartel for the fourth quarter are unchanged.

Domestic prices of the German Steel Syndicate are unchanged for October. The home market is quiet, but production of iron and steel continues at the highest level since the war. Export trade is dull, except in semi-finished material, which is moving in good volume and firm prices to consumers in Great Britain. Export of pig iron to Belgium is also heavy.

Foreign demand for machinery and machine tools is active and machinery exports in August established a new high record.

Large Stocks of Manganese Ore in Caucasus

HAMBURG, GERMANY, Sept. 16.—The large manganese ore contract that the Russian Government recently closed with the United States Steel Corporation has directed the attention of Continental ore consumers to the greatly increased output of the Georgian mines since the Russian Government began operation, after terminating the contract with the Harriman interests in the United States. Operations have been greatly increased and stocks of manganese ore at Black Sea ports and at the mines are of record tonnage. As a result, German merchants dealing in manganese ore hesitate to buy in advance, apprehending that the Rus-

sian Government may find stocks so large as to necessitate "dumping," which would seriously affect the world market.

Stocks of manganese ore in Georgia in June are estimated to have been 500,000 metric tons. In arriving at an estimate it is pointed out that production in the fiscal year 1927-1928, was 304,000 tons, but from Oct. 1, 1928 to June 30, 1929, was 747,500 tons. Exports, however, increased from 203,000 tons in 1927-1928 to a total of 428,000 tons in the period from Oct. 1, 1928 to June 30, 1929. Consumption in Russia advanced from 73,000 tons in 1927-1928 to about 90,000 tons in the October-June period. Stocks at the mines and at ports in Georgia on Oct. 1, 1928, totaled about 200,000 tons.

Second New Krupp Stack Blown In

HAMBURG, GERMANY, Sept. 16.—The Friedrich Krupp A. G. has blown in the second of its new furnaces at Borbeck.

The company has practically completed construction of the largest cement plant in Russia at Gaiduk, Noworossisk, and has installed the machinery.

Recently the Siemens Halske A. G. received the contract to construct an entire automatic telephone system at Hankow, China, with exchanges in other Yangtse Valley cities.

German Exporters Expect More American Business

HAMBURG, GERMANY, Sept. 16.—Exporters of steel believe that the recent sharp reduction in the export prices of semi-finished material will bring increased orders from the United States. American consumers were substantial buyers of German semi-finished steel until the price advances in 1928, when this trade practically ceased.

Recently inquiries from the United States have been more numerous and some small lots have been booked by German mills. Exporters suggest that there is again a possibility of selling small tonnages of sheet bars, billets and skelp to American consumers near Gulf ports.

Output Per Furnace Up

HAMBURG, GERMANY, Sept. 16.—In the past few years German output per blast furnace has been raised materially through construction of larger stacks and abandonment of the older small-capacity furnaces. With 94 furnaces in blast at the end of August, 1925, production totaled 707,311 metric tons, while in August of this year with 95 furnaces in blast, production was 1,167,807 tons. It is expected that 20 or more old furnaces will be dismantled within the next year.

Machinery Markets and News of the Works

Tool Sales Slow Down

Cleveland Exposition This Week Expected, However, to Stimulate Business

SEPTEMBER machine tool sales failed to keep pace with those of August, and in some markets the decline was pronounced. However, the National Machine Tool Exposition in Cleveland this week is expected to stimulate buying, and builders agree that the outlook for fall business is favorable.

The respite in the steady flow of orders has been welcomed by machine tool plants, which have been compelled to push delivery dates farther ahead on account of the heavy accumulation of bookings. Despite the slowing

down in activities, most shops have sufficient business on their books to maintain operations at full capacity until January or February.

The Continental Motors Co., Muskegon, Mich., has made purchases against its list. The Simmons Co., Kenosha, Wis., has placed orders for new press equipment at a cost of \$250,000.

A northern Ohio manufacturer in the automotive field is inquiring for 20 to 30 tools. At Chicago dealers are quoting on a list of 17 machine tools for export to the Orient.

New York

NEW YORK, Oct. 1.—In the week preceding the opening of the National Machine Tool Exposition in Cleveland, sales of machine tools in the New York district turned sharply downward. There was a good volume of inquiry, however, and prospects continue good for the fourth quarter of the year. Considerable prospective business has admittedly been held up because buyers desired to inspect the machines to be shown at Cleveland before placing orders. One pending order for about \$80,000 worth of tools probably will be placed shortly after the end of the Cleveland show. Requirements of the Amtorg Trading Corporation for a new tractor works in Soviet Russia are a feature of current demand.

Contract has been let by Cutler-Hammer Mfg. Co., 8 West Fortieth Street, New York, manufacturer of electrical control equipment and devices, to Barney-Ahlers Construction Corporation, 110 West Fortieth Street, for six-story addition to plant at Southern Boulevard and 144th Street, 90 x 150 ft., to cost about \$300,000 with equipment. Headquarters and main plant are at Milwaukee.

Edward Victor, New York, has leased building at 38-44 West 144th Street, for machine and automobile repair shop.

Apollo Magneto Corporation, Kingston, N. Y., manufacturer of magnetos and kindred products, has acquired plant and business of Automatic Motor Control Corporation, 4-66 Astoria Avenue, Long Island City, and will consolidate. Equipment will be removed to Kingston where production will be concentrated and works will be extended to accommodate increase.

New York Belting & Packing Co., 91 Chambers Street, New York, manufacturer of mechanical belting, etc., will erect four-story and basement addition to plant at Passaic, N. J., to cost over \$250,000 with equipment. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

Safe-Guard Check Writer Corporation, 5 Beekman Street, New York, manufacturer of check protecting devices and equipment, has purchased property and business of Hercules Check Certifier Co., New York, and will consolidate. Expansion is planned.

William A. Lacerenza, 26 Court Street, Brooklyn, architect, has plans for a one-story automobile service, repair and garage building, to cost about \$100,000 with equipment.

Rainbow Luminous Products Co., affiliated with Rainbow Light, Inc., 21-43 Forty-fourth Road, Long Island City, manufacturer of electric tube lighting equipment, is planning expansion to develop new specialties, including aviation beacons, white light tubes for interior lighting, etc. Company has secured financing for work. Raymond R. Machlett is president.

United Electric Coal Companies, Inc., 52 Vanderbilt Avenue, New York, is arranging for purchase of Electric Shovels Coal Corporation and affiliated interests, operating coal properties in Indiana, including surface mining by electric shovels. An expansion program is proposed.

City Council, Mount Vernon, N. Y., will soon begin superstructure for a one-story municipal service, repair and garage building for city-owned motor trucks and cars, to cost \$100,000 with equipment.

American Bread Wrapper Co., 361 East Ohio Street, Chicago, manufacturer of

processed paper wrappers, has leased space in new Bronx terminal of Lehigh Valley Railroad, New York, for factory branch and distributing plant.

Industrial Welded Alloys, Inc., a subsidiary of Industrial Alloy Products Corporation, Newark, Wallace C. Johnson, president, has taken over former local plant of Titan Steel Co., Lister Avenue, for new plant. Property consists of factory units totaling 75,000 sq. ft. floor space. A fabricating and machine shop will be operated for manufacture of stainless steel pressure vessels, pipe condensers, digesters, etc., with foundry for production of stainless steel and other alloy castings.

Harnischfeger Corporation, Milwaukee, and Eastern organization known as Harnischfeger Sales Corporation, 50 Church Street, New York, have leased one-story building totaling 12,000 sq. ft. floor space, to be erected at Hoboken, N. J. It will be equipped as main Eastern factory branch for assembling, repairing and distributing cranes, steam shovels and other hoisting machinery manufactured at Milwaukee plant, to cost more than \$40,000.

Board of Education, Essex County Vocational Schools, Hall of Records, Newark, has rejected bids recently received for new three-story boys' vocational school at Bloomfield, N. J., to cost about \$500,000 with equipment, and will take new bids soon on revised plans. Guilbert & Betelle, 24 Branford Place, are architects.

Newark Rivet Works, Inc., 262 Lafayette Street, Newark, has awarded general contract to William L. Blanchard, 972 Broad Street, for four-story addition, 100 x 100 ft., to cost over \$80,000 with equipment. Victor H. Strombach, 1285 Stuyvesant Avenue, Union, N. J., is architect.

Sylentlyte Corporation, New York, has been formed with capital of 600 shares of no par value common stock to import automobile bodies made by Hibbard & Darrin, Paris, France. Bodies are made entirely of Bohn aluminum. Later they may be manufactured in United States. Offices of company will be at 20 East Fifty-seventh Street, New York, but temporarily all communications should be addressed to William May Wright of Wright, Slade & Co., 71 Broadway, New York.

New England

BOSTON, Sept. 30.—With interest of both buyer and seller focussed on the machine-tool show at Cleveland this week, the New England market is practically at a standstill. No new tools of importance have been sold, and sales of used tools were scattered.

Small tools continue active and deliveries are growing more extended.

W. L. Blake Co., 79 Commercial Street, Portland, Me., mill supplies, has started work on a one-story pipe shop, 80 x 100

ft. Cutting and miscellaneous equipment will be needed.

Samuel Galkin Co., 60 South Water Street, Providence, operating an automobile sheet metal works, is about to start work on a one-story and basement repair shop addition, 46 x 100 ft. Punches and shearing tools may be purchased.

Salem Electric Co., Salem, Mass., has plans for a power house on former Philadelphia & Reading Coal Co. wharf. Details are lacking, but handling equipment will be purchased.

Turners Falls Power & Electric Co., Turners Falls, Mass., has started work on a power station unit, 32 x 95 ft., to cost \$50,000 without equipment.

Anglo-American Textile Machinery Co., Abington, Mass., has plans for a one-story addition, 30 x 100 ft., for one unit and a similar addition for another unit. Special machinery will be purchased.

Reed-Prentice Corporation, Cambridge Street, Worcester, Mass., manufacturer of machine tools, has awarded general contract to E. J. Cross Co., 82 Foster Street, for one-story addition, 65 x 150 ft., to cost about \$50,000 with equipment.

Associated Gas & Electric Co., 61 Broadway, New York, has work under way on addition to artificial gas plant at Worcester, Mass., to have capacity of 7,000,000 cu. ft. carbureted gas per day, to cost over \$500,000 with line extensions. Company is also carrying out expansion at Plattsburg, N. Y., where new artificial gas unit of 600,000 cu. ft. capacity will be installed and new distributing lines constructed.

Walworth Co., Statler Building, Boston, manufacturer of valves, steam specialties, etc., has purchased plant and business of Westcott Valve Co., East St. Louis, Ill., and will consolidate. Westcott plant will be continued for Middle West factory branch, and expansion carried out.

Hawie Mfg. Co., 729 North Washington Avenue, Bridgeport, Conn., manufacturer of wire goods, sheet metal buckles, etc., has filed plans for a one-story addition, 50 x 89 ft., to cost about \$24,000 with equipment.

Board of Education, Woburn, Mass., will install manual training department in new one- and three-story high school to cost about \$600,000, for which plans have been filed.

American Reinforced Paper Co., Starkey Avenue, Attleboro, Mass., has awarded general contract to C. K. Rathbone, Hospital Trust Building, Providence, for one-story addition, 45 x 175 ft., to cost about \$45,000. Charles T. Main, Inc., 201 Devonshire Street, Boston, is architect.

Plainville Electro-Plating Co., Plainville, Conn., has begun construction of one-story plant, to cost about \$20,000 with equipment.

Detroit Radio Products Corporation, 1040 West Fort Street, Detroit, has leased space in former plant of Everett Mills, Lawrence, Mass., for branch plant.

Buffalo

BUFFALO, Sept. 30.—Contract has been let by Rollway Bearing Co., 541 Seymour Street, Syracuse, N. Y., manufacturer of metal bearings to Hemmer Co., 315 Sunset Avenue, for one-story addition, to cost about \$30,000 with equipment.

Officials of Columbus-McKinnon Chain Co., Tonawanda, N. Y., manufacturer of steel and iron chains, etc., have organized a company under same name, with capital of 30,000 shares of stock, no par value, to take over and expand local plant. New

company is headed by Julius F. Stone, 1062 Westwood Avenue, Columbus, Ohio; Julius F. Stone, Jr., and Frank T. Stone, Tonawanda.

Union Free School District No. 6, Elliott, N. Y., is said to be planning installation of manual training equipment in two-story high school at Falconer, N. Y., to cost about \$240,000, for which bids have been asked on general contract. R. A. Freeburg, Hotel Jamestown Building, Jamestown, N. Y., is architect.

Consolidated Aircraft Corporation, 2050 Elmwood Avenue, Buffalo, has acquired Fleet Aircraft Corporation, Buffalo, and will consolidate. Fleet plant will be continued in service and capacity increased from two to three planes daily. Company has also purchased a substantial interest in Kinner Airplane & Motor Corporation, Glendale, Cal., and will be active in management of that organization, which will develop larger capacity. Lawrence D. Bell is vice-president.

Houdé Engineering Corporation, 537 East Delavan Avenue, Buffalo, manufacturer of shock absorbers, a subsidiary of Houdaille-Hershey Corporation, same address, is arranging an expansion program to cost \$200,000. Majority of fund will be used for purchase of new equipment. Parent organization is also making additions to plants of General Spring Bumper Corporation, Chicago and Decatur, Ill., another unit.

Philadelphia

PHILADELPHIA, Sept. 30.—Bids will be asked in about 30 days by F. G. Vogt & Sons, Inc., Thirtieth and Race Streets, Philadelphia, meat packer, for three- and four-story plant, to cost \$1,000,000 with equipment; a refrigerating plant will be installed. C. B. Comstock, 110 West Fortieth Street, New York, is architect and engineer.

Paper Manufacturers' Co., Fifth and Willow Streets, Philadelphia, manufacturer of paper products, has awarded general contract to Edwin E. Hollenback, Inc., 1910 North Marshall Street, for new plant unit, to cost \$50,000 with equipment. Clarence E. Wunder, 1520 Locust Street, is architect.

Lamont Gear & Machine Co., Inc., 2631 West Oxford Street, Philadelphia, has leased a part of building at Rising Sun Avenue and Bristol Street for parts production and assembling.

Board of Education, Nineteenth and Ludlow Streets, Philadelphia, is considering installation of manual training equipment in new four-story and basement junior high school at Thirty-third and Tasker Streets, to cost \$1,200,000, for which plans are being completed by Irwin T. Catharine, architect for board, address noted.

Sol J. Maschke, 6244 Chestnut Street, Philadelphia, and associates have organized Rusticraft Fence Co., with capital of \$100,000, to operate a plant at Malvern, Pa., to manufacture iron and other metal fencing, garden and farm furniture, etc. Samuel H. Tendler, 5459 Euclid Avenue, Philadelphia, is interested in new organization.

Good Lines, Inc., Camden, N. J., care of O. H. Higginbotham, Camden, recently formed by Mr. Higginbotham and associates, has purchased five-acre tract at Hi-Nella, N. J., as site for new plant to manufacture airplanes. Departments for parts production and assembling will be installed. Plans will be drawn at once. Plant will cost more than \$65,000 including equipment.

Board of Education, Bridgeton, N. J., plans installation of manual training equipment in new two-story junior high school to cost \$400,000, for which bids have been asked on general contract. Edwards & Green, 548 Federal Street, Camden, N. J., are architects.

Modern Utilities Co., Paxton Street, Harrisburg, Pa., manufacturer of floor plates for fitting around radiator and steam pipes, scales for measuring pipe lines, levels, etc., is planning expansion, increasing capacity of present plant to concentrate production at that place, discontinuing out-of-town manufacture and assembling at Harrisburg. Work will cost more than \$50,000 with equipment. Grover C. Frantz is head.

Standard Oil Co. of Pennsylvania, Inc., Sixth and Chestnut Streets, Philadelphia, is planning new oil storage and distributing plant at Lancaster, Pa., to cost about \$140,000 with equipment.

Inland Utilities, Inc., Harrisburg, Pa., operating water and gas properties in Pennsylvania and West Virginia, is disposing of new bond issue of \$3,250,000, part of proceeds to be used for extensions and improvements in plants and systems.

South Atlantic

BALTIMORE, Sept. 30.—Contract has been let by Flynn & Emrich Co., 301 North Holliday Street, Baltimore, manufacturer of mechanical stokers, parts, etc., to C. W. Schmidt, Hearst Tower Building, for one-story addition, to cost \$75,000 with equipment. W. S. Austin, Maryland Trust Building, is architect and engineer.

Davison Chemical Co., Garrett Building, Baltimore, manufacturer of commercial fertilizers, acids, etc., has acquired 15 acre tract on Houston ship channel, Houston, Tex., as site for new plant, including machine shop, boiler house and other structures, to cost about \$850,000 with machinery. Company operates a subsidiary under name of Davison-Pick Fertilizers, Inc., Whitney Building, New Orleans, with plants at New Orleans and Orange, Tex.

Carolina-Virginia Power Co., Roanoke Rapids, N. C., has applied for permission to construct a hydroelectric generating plant on Roanoke River, about 20 miles from city, where site has been secured, to have initial capacity of 30,000 hp. Transmission lines will be built for connection with system of Virginia Electric & Power Co., Richmond, which will use large part of output. Project will cost over \$700,000.

Tide Water Oil Sales Corporation, Court Square Building, Baltimore, a subsidiary of Tide Water Oil Corporation, 11 Broadway, New York, will take bids in about 30 days for second unit of storage and distributing plant at Wagners Point, to cost more than \$150,000 with equipment.

Curtiss Airports Corporation, 27-29 West Fifty-seventh Street, New York, has awarded contract to Engstrom & Wynn, 1117 Chapline Avenue, Wheeling, W. Va., for two-story hangar, 100 x 120 ft., at Baltimore, to include reconditioning and repair department, to cost about \$80,000 with equipment. Kenneth Franzheim, 345 Madison Avenue, New York, is architect.

Horace E. Dodge Boat & Plane Co., 3 East Fifty-second Street, New York, Horace E. Dodge, president, recently organized to manufacture motor boats, flying boats and amphibian planes, has engaged Philip L. Small & Associates, Terminal Tower Building, Cleveland, architects and engineers, to prepare plans and supervise construction of new plant

on 100 acre tract at Newport News, Va., recently acquired, to cost about \$1,000,000 with equipment. Company will take over and succeed to Horace E. Dodge Boat Works, Inc., 614 Lycaete Avenue, Detroit, and will remove plant to new location, where increase in present output will be carried out. J. Gilmore Fletcher is vice-president, and William M. Horne, secretary and treasurer.

Georgia Power Co., Atlanta, Ga., has plans for construction of new hydroelectric generating station on Oconee River at Purman Shoals, about four miles from Milledgeville, Ga., with initial capacity of 60,000 hp., divided into two 30,000 hp. generating units. Project will include transmission system to connect with present lines of company, and will cost more than \$1,000,000.

City Council, Griffin, Ga., E. P. Bridges, city manager, will receive bids until Oct. 10 for equipment for new water supply development, including electric-operated pumping machinery with accessories, 300,000 gal. capacity steel standpipe, etc. Robert & Co., Inc., Bona Allen Building, Atlanta, Ga., is engineer.

Chicago

CHICAGO, Sept. 30.—Of special interest in local machine-tool trade circles is a list of 17 machines for export to the Orient. Progress is said to have been halted on the Pullman company's list for its Buffalo plant. Additional purchases have been made against the requirements of Continental Motors Corporation, Muskegon, Mich. Preliminary steps are being taken by a farm implement manufacturer to enter the market in a large way later this year. Railroad inquiry is confined to a request from the Illinois Central which is asking for prices on a 5-ft. radial drill. Simmons Co., Kenosha, Wis., has recently placed orders for new press equipment that aggregate close to \$250,000.

As a whole September has been a profitable month for most sellers. Orders for large and small tools have been scattered, but the aggregate was good volume. Sales quotas in most instances were passed soon after the middle of the month.

The list for export to the Orient follows:

- One 20-in. drill
- One 20-in. shaper
- One No. 2 key slotter
- One 6-in. x 6-in. hack saw
- One 24-in. and one 12-in. lathes
- One 6-in. pipe machine
- One sensitive drill
- One 8-ft. steel break
- One slitting shear
- Two 3-in. punches, one 24-in. throat and one 30-in. throat
- One plate bending roll
- One 40-lb. hammer
- One tool and drill grinder
- One 62-in. boring mill
- One universal miller

Ingalls-Shepard Division of Wyman Gordon Co., Harvey, Ill., has started erection of an addition to house a heat-treating department.

Injunction halting construction of North Shore Foundry, Greenfield Avenue, North Chicago, has been dissolved by court action.

Hafner Mfg. Co., Chicago, maker of mechanical toys, has purchased site, 100 x 300 ft., on Kolmar Avenue, for one-story factory. Austin Co. is drawing plans.

The Crane Market

NEW inquiry for overhead cranes is small, but some substantial orders are pending award. A recent inquiry includes four 10-ton electric cranes for a plant in Chattanooga, Tenn. Among locomotive crane inquiries is one from the Baltimore & Ohio Railroad for two 25-ton, Diesel-driven cranes. Fay, Spofford & Thorndyke, Boston, consulting engineers, have been accepting bids on two 10-ton and two 20-ton, electric overhead cranes for the cast iron pipe foundry to be erected at Chelsea, Mass., for the Intercontinental Pipe & Mining Co. The National Tube Co., Chicago, is inquiring for a sizable list of electric traveling cranes.

Among recent purchases are:

Amtorg Trading Corporation, New York, 20-ton, 48-ft. span, hand power crane from Box Crane & Hoist Corporation.

Delaware, Lackawanna & Western Railroad, New York, four 5-ton, 26-ft. span hand power cranes for sub-stations at Newark, Summit, Kingsland and Den-ville, N. J., from Box Crane & Hoist Corporation.

General Electric Co., Schenectady, N. Y., two 10-ton electric cranes from unnamed bidder.

W. W. Jourdin Co., New York, 10-ton, 48-ft. span hand power crane from Box Crane & Hoist Corporation.

Edison Electric Appliance Co., Chicago, 10-ton, 61-ft. span overhead electric crane from unnamed bidder.

International Harvester Co., West Pullman, Ill., 15-ton, 113-ft. span electric crane from Whiting Corporation.

Broderick Co., Muncie, Ind., 20-ton, 60-ft. span electric crane from unnamed bidder.

Onsoud Machine Works, Chicago, 10-ton, 38-ft. span overhead electric crane from Whiting Corporation.

Rundle Mfg. Co., Milwaukee, 5-ton, 80-ft. span and 3-ton, 23-ft. span overhead electric cranes from Milwaukee Electric Crane & Mfg. Corporation.

Faith Mfg. Co., 2531-33 North Ashland Avenue, Chicago, manufacturer of die castings, etc., has awarded contract to W. Maedje, 5033 North Kostner Avenue, for a two-story plant, 120 x 145 ft., to cost about \$70,000 with equipment.

Standard Oil Co., Main Street, Decatur, Ill., has plans for one-story storage and distributing plant at Robinson, Ill., to cost about \$50,000 with equipment.

City Council, Duluth, Minn., has plans for steam power plant for central heating service in downtown district, to cost about \$850,000 with equipment. W. J. Sullivan, Palladio Building, is architect.

Chicago, Rock Island & Pacific Railroad Co., 179 West Jackson Boulevard, Chicago, has awarded general contract to A. H. Neumann & Co., Hubbell Building, Des Moines, Iowa, for addition to local engine house, with repair facilities, to cost \$65,000. A. T. Hawks is chief engineer.

Flour City Ornamental Iron Works, Inc., 2637 Twenty-seventh Avenue, South, Minneapolis, will soon begin superstructure for two-story addition, 60 x 100 ft., for which general contract recently was let to Piper, Drake & Schumacher, Baker Building, to cost about \$45,000 with equipment.

International Tool & Engineering Co., 1910 Kedzie Avenue, Chicago, has asked

bids on general contract for one-story unit, to cost about \$30,000 with equipment. C. E. Frazier, 64 West Randolph Street, is architect. O. B. Bensen is president.

Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Third Avenue, South, and Washington Street, Minneapolis, Minn., has plans for addition to local engine house, with repair facilities, to cost more than \$80,000 with equipment. Arthur Daniels is district engineer.

Gardner-Denver Co.'s plant addition at Quincy, Ill., will be ready for occupancy Dec. 1. Company manufactures slush pumps, air compressors, rock drills, drill sharpeners and high-pressure drill steel forges. It has other plants at Denver, and La Grange, Mo.

Pittsburgh

PITTSBURGH, Sept. 30.—Machine-tool business has been rather quiet the past week, but inquiries are coming out regularly and orders are expected to improve materially after the machine-tool show in Cleveland. The list of the Westinghouse Electric & Mfg. Co. will be issued this week and it is expected to fully equal the usual quarterly requirements of that company. Railroad buying still lags, but improvement is looked for as the carriers are announcing heavy fall inquiries for rails and cars, and plan to be busy in their own shops also.

Deliveries of machine tools and heavy machinery are considerably delayed by many companies and local dealers are unable to bid on inquiries on which they would ordinarily be interested. Plant extensions in the Youngstown district are expected to require heavy quotas of tools and equipment and some large projects in the Pittsburgh area are quickly reaching the buying stage.

Contract has been let by Titusville Iron Works, Inc., Titusville, Pa., to Austin Co., Cleveland, for one- and two-story addition, 50 x 150 ft., to cost more than \$100,000 with equipment.

Pittsburgh Metal Airplane Co., Pittsburgh, organized a few months ago by officials of Pittsburgh Aviation Industries Corporation, and now occupying part of former plant of American Car Co., will increase facilities for manufacture of all-metal cabin aircraft. Company has recently acquired Thaden Metal Aircraft Co., San Francisco, which has been removed to Pittsburgh where production will be concentrated. H. V. Thaden is chief engineer.

West Penn Power Co., West Penn Building, Pittsburgh, is arranging for a preferred stock issue to total \$9,000,000, part of fund to be used for extensions and improvements in power properties and systems in western Pennsylvania and West Virginia.

Iroquois Gas Co., Oil City, Pa., subsidiary of National Fuel Gas Co., is carrying out expansion, to include construction of about 75 miles of new high-pressure transmission pipe lines, and 65 miles of low-pressure lines. Company has also acquired oil and natural gas lands in Cataraugus, Wyoming and Allegheny counties for development.

Fairmont Mining Machinery Co., Tenth Street, Fairmont, W. Va., is planning one-story addition to structural shop for fabricated steel production, one-story addition to foundry, and enlargements in machine shop. A new overhead traveling crane system will be installed. En-

tire program will cost about \$100,000 including equipment.

City Council, Huntington, W. Va., has plans for a new hangar of six-plane type at municipal airport, with repair and reconditioning facilities, to cost about \$50,000 with equipment. Louis Stone is field manager.

Pennsylvania Pipe Thread Protector Co., Pittsburgh, recently formed by Maurice M. Cavitt, 806 Heberton Avenue, and associates, is considering operation of local plant to manufacture pipe thread protectors, pipe fittings and kindred specialties. Company is capitalized at \$50,000. Martin J. Roeser, 4743 Baum Boulevard, is interested in new organization.

Direct Flush Tank Co., Huntington, W. Va., has been incorporated to hold patent rights on a flush tank designed by D. F. Tracey. Company is soliciting inquiries from manufacturers who can furnish sheet metal and cast iron enameled tanks, vitreous porcelain tanks, brass flush valves, brass syphons and other metal parts. Communications should be addressed to D. F. Tracey, Box 55, Huntington.

Cleveland

CLEVELAND, Sept. 30.—The falling off in machine-tool sales, previously noted, has become more general, the slackening in orders having extended to some manufacturers who had not been affected by the lull. September sales showed a sharp decline as compared with August. Deliveries of some lines are beginning to show some improvement. Manufacturers are not much concerned over the slowing down as the majority have good backlogs of orders.

An inquiry for 20 to 30 machines from a northern Ohio manufacturer in the automotive field came out the past week. The prospective buyer may purchase used machinery. A fair amount of business is in prospect in single tool orders, but most of this is being held until after the machine-tool show this week.

Wheeler Metal Products Corporation, 1637 Collamer Avenue, Cleveland, has awarded contract to Austin Co. for a one-story addition, 80 x 300 ft. Company will extend its products to include heavy steel stampings and will use new building for steel stamping plant and other manufacturing purposes.

Osborn Mfg. Co., Cleveland, will erect an addition, 49 x 106 ft.

John Harsch Bronze & Foundry Co., manufacturer of brass, bronze, aluminum and manganese castings, Cleveland, states that it does not intend to build a new plant in near future, as reported recently in these columns. Company says that it will not build for at least two years.

Plans are being completed by Toledo Pipe Threading Machine Co., 1445 Summit Avenue, Toledo, Ohio, manufacturer of machine tools, for a two-story addition, to cost about \$50,000 with equipment. Mills, Rhines, Bellman & Nordhoff, Ohio Building, are architects and engineers.

Sterling Grinding Wheel Co., Tiffin, Ohio, manufacturer of grinding wheels and other abrasive materials, has asked bids on general contract for a one-story addition, to cost about \$45,000 with equipment. George S. Rider Co., Century Building, Cleveland, is architect and engineer.

Youngstown Radio, Lamp & Novelty Co., Scienceville Road, Youngstown,

manufacturer of radio equipment, metal products, etc., has plans for a one- and two-story plant, to cost about \$30,000 with equipment. Zenk & Campbell, 120 Wood Street, are architects.

National Lime & Stone Co., Bluffton, Ohio, is planning to rebuild part of quarry and mill destroyed by fire Sept. 19.

Dauntless Coal Co., Saltillo, Ohio, is planning expansion, including installation of mining machinery and surface equipment.

Columbia Axle Co., 852-76 East Seventy-second Street, Cleveland, manufacturer of automobile axles, etc., is considering one-story addition, to cost about \$40,000 with equipment.

P. E. Hart, Akron, Ohio, and associates have organized Snyder-Hart Co. to manufacture radio equipment and parts. Former local mill of American Tire & Rubber Co. will be remodeled for initial plant. Floyd C. Snyder, Massillon, Ohio, is president.

Department of Parks and Public Property, City Hall, Cleveland, R. L. Harding, director, has plans for one-story municipal automobile service, repair and garage building, to cost about \$100,000 with equipment. H. Kregelius, City Hall, is city architect.

St. Louis

ST. LOUIS, Sept. 29.—Woods Brothers, Inc., 407 Security Building, Kansas City, Mo., manufacturer of airplanes and parts, is considering plans for new one-story plant at St. Joseph, Mo., for parts production and assembling, to cost about \$55,000 with equipment. G. E. Stanley is one of heads of company in charge.

Central Brass & Aluminum Foundry Co., 503 South Twenty-first Street, St. Louis, has filed plans for a one-story addition, 33 x 60 ft., to cost about \$20,000 with equipment.

National Garage Co., 1220 West Sixty-second Street, Kansas City, Mo., Harry A. Rubin, president, has plans for a six-story and double basement service, repair and garage building, 115 x 155 ft., with foundations to carry six additional stories, to cost more than \$500,000 with equipment. Charles A. Smith, Finance Building, is architect.

Common Council, Galt, Mo., has approved plans for a municipal electric light and power plant, to cost about \$35,000 with equipment. Rollins Engineering Co., Railway Exchange Building, Kansas City, Mo., is engineer.

Pittsburgh Equitable Meter Co., 400 Lexington Avenue, Pittsburgh, manufacturer of gas meters, parts, etc., has plans for one-story factory branch and distributing plant at Tulsa, Okla., 50 x 150 ft. to cost about \$65,000 with equipment. Rush, Endacott & Goff, New Wright Building, Tulsa, are architects. A. J. Kerr, Kennedy Building, is local manager.

Ryan Aircraft Corporation, Lambert-St. Louis Flying Field, St. Louis, manufacturer of airplanes and parts, has plans for new one-story unit for parts production and assembling, to cost about \$90,000 with equipment, near present plant or at Parks Airport, East St. Louis, Ill. Company is subsidiary of Aircraft Development Corporation, Union Trust Building, Detroit.

Curtiss Flying Service, Inc., Britton, Okla., B. S. Graham, local manager, with headquarters at 27-29 West Fifty-seventh Street, New York, has plans for new hangar, 100 x 120 ft., at local airport, with two-story reconditioning and repair shop adjoining, to cost \$75,000 with equip-

ment. M. L. Russell Co., Britton, is engineer.

DeCamp Consolidated Glass Casket Co., Muskogee, Okla., J. W. DeCamp, president, is considering three-story addition, 75 x 150 ft., to cost more than \$90,000 with equipment.

Forrest City Cotton Oil Co., Forrest City, Ark., is planning one-story addition to cottonseed oil mill, to cost about \$55,000 with equipment. Philip Hickey is general manager.

Ovens, power equipment, conveying and other machinery will be installed in four-story baking and coffee roasting plant to be erected by Bird Stores, Inc., 2101 Broadway, Kansas City, Mo., to cost about \$220,000. Contract for superstructure has been let to John T. Thompson Construction Co., Huntzinger Building. Archer & Gloyd, Pioneer Trust Building, are architects; Hans von Unwerth, Finance Building, is mechanical engineer.

Fort Smith Gas Co., Fort Smith, Ark., is contemplating construction of pipe line from natural gas field at Lavaea to city limits, to cost about \$100,000 with pressure stations, etc. A. Graham Williams is general manager.

Davis Boring Tool Co., 6200 Maple Avenue, St. Louis, has been incorporated to take over business of Davis Boring Tool Co., division of Larkin Packer Co., manufacturer of standard and special boring tools, blocks, cutters and reamers. B. J. Jostrand is secretary.

Detroit

DETROIT, Sept. 30.—North-Moeller Co., West Cortland Avenue, Jackson, manufacturer of grinding wheels and other abrasive materials, has awarded general contract to Macklin Co., Wildwood Avenue, for one-story addition, to cost about \$60,000 with equipment.

Hastings Mfg. Co., Hastings, manufacturer of automobile equipment and accessories, will erect one-story addition, 65 x 320 ft., to cost more than \$85,000 with equipment.

City Council, Battle Creek, plans extensions at Kellogg municipal airport, including construction of several new hangars, with shop and reconditioning facilities and other field units, to cost more than \$80,000 with equipment.

Koestlin Tool & Die Co., 3601 Humboldt Avenue, Detroit, is taking bids on general contract for one and two-story addition, 65 x 120 ft., to cost about \$60,000 with equipment. Muller & Krecke, American Radiator Building, are architects.

United Brass & Aluminum Mfg. Co., Port Huron, is considering rebuilding, part of plant recently destroyed by fire.

Venton Steel Sash Co., Sixth Street, Muskegon, manufacturer of steel sash doors, etc., has rejected bids for two one-story additions, and will have revised plans drawn at once, entire project to cost about \$80,000 with equipment. A. A. Wickland & Co., 205 West Wacker Drive, Chicago, are architects.

Grand Trunk Railway Co., 400 East Jefferson Street, Detroit, is completing plans for electrification of four-track road from Detroit to Pontiac, to cost more than \$2,500,000 with equipment.

Chrysler Corporation, 12200 East Jefferson Street, Detroit, has approved plans for a one-story machine shop 150 x 160 ft., to cost about \$85,000 with equipment.

Detroit Steel Products Co., Mound and Lynch Roads, Detroit, has begun erection of new plant group to cost more than \$500,000 with equipment. Work will in-

clude one-story power plant. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

Board of Trustees, State of Michigan College of Mining and Technology, Houghton, will soon take bids for three-story addition to mechanical and electrical engineering building, to cost \$340,000 with equipment. Derrick Hubert, 801 Sheridan Road, Menominee, is architect.

City Council, Allegan, Mich., has plans for municipal hydroelectric generating station, to cost about \$500,000 with equipment, and will proceed with project at early date. Ayres, Lewis, Norris & Mays, Ann Arbor, are engineers.

Saginaw Foundries Co., Saginaw, Mich., has been incorporated with capital of \$200,000 to manufacture electric steel and gray iron castings. It has taken over a plant containing a gray iron foundry and is remodeling part of building for production of electric steel castings. Company should be addressed care of Wickes, Stork & Pletscher, Saginaw.

Milwaukee

MILWAUKEE, Sept. 30.—Sales of machine tools are holding up to the recent level, but the volume of inquiries has fallen off. Manufacturers of agricultural implements and tractors are at nearly peak production. There is still a shortage of skilled mechanics.

Caswell Mfg. Co., 1000 St. Paul Avenue, Milwaukee, maker of portable electric phonographs, electrical pickups and other specialties, has leased a floor at 470-488 Virginia Street, about 20,000 sq. ft., for expansion.

H. W. Buemming, architect, 521 Jackson Street, Milwaukee, is taking bids for a three-story and basement factory, 63 x 134 ft., at West Allis, for Christian Hansen's Laboratories, Little Falls, N. Y. Two boilers, 10,000-gal. tank and cold storage facilities will be installed.

L. C. Hirschheimer, Inc., La Crosse, Wis., gray iron castings, has under construction first unit of a new plant, 80 x 180 ft., to cost \$50,000.

Great Lakes Coal & Dock Co., Superior, Wis., will build dock No. 2 at Allouez Bay to cost about \$500,000. M. J. Bartelme is superintendent and Roland C. Buck, Inc., United States National Bank Building, Superior, is engineer.

Indiana

INDIANAPOLIS, Sept. 30.—Contract has been let by Horat Brothers Machine Co., Ferry Street, Lafayette, manufacturer of machinery and parts, to Schroyer & Parker, Farmers' & Traders' Bank Building, for one-story addition, 60 x 100 ft., to cost about \$24,000 with equipment.

Bendix Aviation Corporation, South Bend, manufacturer of accessories for airplanes and automobiles, has approved an expansion program to cost more than \$600,000, including erection of several multi-story factory units, one-story foundry, housing development for employees and other work. It is understood that part of new buildings will be used for affiliated organizations, including Bendix Brake Corporation.

Hartford City School Board, Hartford City, has plans for a new vocational training school, to cost about \$100,000 with equipment. Houck & Smenner, 108

East Washington Street, Muncie, are architects.

Capehart Automatic Phonograph Co., East Pontiac Street, Fort Wayne, has taken bids on general contract for one-story addition for assembling and other work, to cost about \$35,000 with equipment. Charles R. Weatherhogg, 250 West Wayne Street, is architect.

Bunnell-Moorhan Motors, Inc., 598 Hohman Street, Hammond, has plans for two-story service, repair and garage building, to cost \$140,000 with equipment. L. C. Bernard, First Trust Building, is architect.

Board of Trustees, Indiana University, Bloomington, plans rebuilding part of power plant destroyed by fire Sept. 24.

Gulf States

BIRMINGHAM, Sept. 30.—Contract has been let by Cameron Iron Works, Inc., 711 Milby Street, Houston, Tex., to Truscon Steel Co., 1701 Oliver Street, for one-story unit, 100 x 102 ft., to cost about \$35,000 with equipment.

Markle Steel Co., Shepherd Street, Houston, Tex., has plans for one-story shop addition, 100 x 125 ft., to cost about \$75,000 with equipment. Giesecke & Harris, Second National Bank Building, are architects.

Company has been organized at Mount Calm, Tex., Hill County, under direction of local Commercial Club, H. M. Keeling, secretary, to construct an oil refinery on local site. Initial unit will be equipped to handle about 500 bbl. of crude oil per day, and will be supplemented with other units later, entire project to cost more than \$150,000 with machinery. R. C. Pool, cashier of First National Bank, Mount Calm, and L. D. Mitchell, San Antonio, Tex., are interested in project.

Alabama Power Co., Birmingham, is arranging for expansion at Gadsden, Ala., to include installation of new equipment in power substations and switching plants, and construction of transmission lines; electric traveling cranes will be installed. Project will cost more than \$450,000.

Continental Gin Co., Fourth Avenue South and Forty-sixth Street, Birmingham, manufacturer of cotton-ginning machinery, parts, etc., has awarded general contract to D. T. Underwood, Pioneer Building, for three-story addition for storage and distribution, 81 x 200 ft., to cost about \$100,000 with equipment.

Orleans Parish School Board, City Hall Annex, New Orleans, will install manual training department in new three-story school to be erected at Algiers, to cost over \$175,000, for which bids are being asked on general contract until Oct. 11. E. A. Christy is supervising architect for board.

Food Machinery Corporation, Tampa, Fla., has purchased local plant and business of Skinner Mfg. Co., manufacturer of citrus packing house machinery and parts. New owner plans expansion.

National Electric Mfg. Co., Florence, Ala., manufacturer of electric stoves and ranges, is considering removal of plant to Jackson, Miss., where capacity of about 500 units per month will be increased. It is understood that company will be reorganized with W. H. Jolly, Florence, as president, and T. B. Cabell, Jackson, vice-president.

Texas-Louisiana Power Co., Fort Worth, Tex., has begun construction of an addition to steam-operated electric generating plant at Pecos, Tex., with installation of new engine unit and auxiliary

equipment, to cost over \$100,000; transmission lines will be extended.

City Council, Ocala, Fla., and Board of County Supervisors have approved plans for city-county airport, to include hangar, repair shop, oil storage and other field units, to cost more than \$70,000 with equipment. J. E. Walker, County engineer, will supervise installation.

Crane Co., 336 South Michigan Avenue, Chicago, has plans for three-story factory branch and distributing plant, 100 x 105 ft., at Jacksonville, Fla., to cost over \$75,000 with equipment. Marsh & Saxelbye, Consolidated Building, Jacksonville, are architects.

Austin Bridge Co., 1813 Clarence Street, Dallas, Tex., has plans for a one-story steel fabricating works, to cost more than \$80,000 with equipment.

Cincinnati

CINCINNATI, Sept. 30.—Metal Aircraft Corporation, Cincinnati, manufacturer of airplanes, with plant at Lunken airport, has been acquired by new interests headed by Robert H. Schryver, Columbus, Ohio, which will take over and operate property at once. Plans are being completed for acquisition of Johnson Airplane Supply Co., Dayton, Ohio, manufacturer of aircraft parts, by same interests, and two companies will be consolidated. Mason & Dixon Air Lines, Inc., Cincinnati, will be included in merger. Plant of Metal Aircraft Corporation will be increased for additional output.

Hobart Mfg. Co., Troy, Ohio, manufacturer of meat choppers, etc., is planning to produce a line of meat and bread slicers and kindred edge tools. Plans have been filed for a one-story addition to cost about \$20,000. H. L. Johnston is president.

Frigidaire Corporation, 334 North Taylor Street, Dayton, manufacturer of electric refrigerators and refrigerating units, has filed plans for one-story addition, to cost about \$30,000 with equipment. Company is a subsidiary of General Motors Corporation.

Dayton Airplane Engine Co., 1246 Leo Street, Dayton, manufacturer of aircraft engines and parts, is considering a one-story addition to cost about \$70,000 with equipment, and contemplates an expansion program to cost over \$400,000. Company has purchased Eastern Aircraft Corporation, Pawtucket, R. I., manufacturer of all-metal airplanes of German (Messerschmitt) type, and will operate as a unit of organization.

Pritchett-Thomas Co., Stahlman Building, Nashville, Tenn., has awarded general contract to Foster & Creighton, Fourth and First National Bank Building, for six-story and basement automobile service, repair and garage building, 100 x 175 ft., to cost about \$450,000 with equipment. Marr & Holman, Stahlman Building, are architects.

Leland Electric Co., Dayton, Ohio, manufacturer of fractional horsepower electric motors, parts, etc., has disposed of a stock issue totaling \$356,250, part of proceeds to be used for expansion. Company recently completed new plant unit.

Pacific Coast

SAN FRANCISCO, Sept. 26.—Plans are being considered by American Pipe & Steel Corporation, Alhambra, Cal., for extensions and improvements in plant, to cost about \$55,000 with equipment.

John and Donald B. Parkinson, Title Insurance Building, Los Angeles, archi-

rects, have plans for one-story automobile service, repair and garage building, 100 x 250 ft. to cost \$100,000 with equipment.

Pacific Telephone & Telegraph Co., 740 South Olive Street, Los Angeles, has purchased property at Ventura, for one-story equipment storage and distributing plant, 200 x 200 ft., to cost over \$75,000 with equipment. A mechanical department will be installed.

American Can Co., Hunter-Dulin Building, San Francisco, has awarded general contract to Lindgren & Swinerton, Inc., 225 Bush Street, for four-story addition, to be used in part for storage and distribution, to cost about \$100,000 with equipment. Company engineering department is in charge. Headquarters are at 120 Broadway, New York.

M. & M. Plywood Co., Longview, Wash., has approved plans for initial unit of new one-story mill, 200 x 400 ft., for manufacture of veneer and plywood specialties, to cost over \$80,000 with equipment. Malarkey & Kallander, Postal Telegraph Building, Portland, are architects and engineers.

Firestone Tire & Rubber Co., Akron, Ohio, has plans for a one and one-half story factory branch, storage and distributing plant at Eugene, Ore., to cost about \$100,000 with equipment.

Utah Oil Refining Co., Salt Lake City, Utah, is contemplating extensions and improvements in oil refinery to cost more than \$350,000 with equipment.

American Concrete Pipe Co., San Diego, manufacturer of heavy concrete pipe sections of large diameter, will begin construction of new plant at Old Town, to cost \$100,000 with equipment.

San Francisco Bay Airdome, Inc., care of Lynn Schloss, 1541 Webster Street, Alameda, Cal., engineer, will soon take bids for a new airport near Estuary Tube, consisting of three steel hangars, repair and reconditioning shops, oil storage and other field units, to cost over \$600,000 with equipment. James A. Talbott, an official of Richfield Oil Co., San Francisco, is president.

Western Gear Works, Seattle, and Pacific Gear & Tool Works, San Francisco, have been merged. Companies will retain separate identity and there will be little change in personnel, but each will have benefit of patents, patterns, engineering and plant facilities of other.

Banta Ornamental Iron Shop, 122 West Twenty-eighth Street, Los Angeles, has been incorporated to continue manufacture of wrought iron specialties made by company for past year.

Canada

TORONTO, Sept. 30.—Superior Alloys Ltd., Sault Ste. Marie, Ont., has awarded contract to McLarty Brothers, for erection of a plant to cost \$75,000. Two electric furnaces will be installed.

Quebec Railway, Light, Heat & Power Co., 265 St. Joseph St., Quebec, will start work before close of year on erection of a substation to cost \$650,000.

Barry & Ostler, Kirkcaldy, Scotland, contemplate erection of a linoleum manufacturing plant at Farnham, Que., work to start next spring.

Noranda Mines, Ltd., Rouyn, Que., has plans for a five-story plant at Levis, Que., to cost \$350,000. Tenders will be called during winter for construction and equipment.

Work has started on the erection of a plant at Simcoe, Ont., for American Can Co., to cost \$1,000,000. J. F. Abbey is engineer.

Canadian Paper Board Co., 32 Front Street West, Toronto, has awarded contract to Stephens Engineering & Supply Co., 25 St. Patrick Street, for an addition, to cost \$60,000. Kerry & Chase, Confederation Life Building, Toronto, are engineers.

Dominion Wheel & Foundries Ltd., 121 Eastern Avenue, Toronto, has awarded contract to J. R. Page, 18 Toronto Street, for a machine shop and garage to cost \$70,000. James Proctor & Refdfern Ltd., 36 Toronto Street, is engineer.

Plant of Morash Stove Co., Morrisburg, Ont., was recently destroyed by fire with a loss of about \$100,000. Owner contemplates rebuilding.

Stoughton Co., Stoughton, Wis., manufacturer of automobile bodies, is having plans prepared for erection of a sub-assembly plant at Regina, Sask.

Foreign

PLANs are being arranged by Eisler Electric Corporation, 750 South Thirteenth Street, Newark, recently formed to take over and expand Eisler Engineering Co., Inc., same address, manufacturer of machinery for production of radio tubes, incandescent lamp machinery, etc., for establishment of a branch plant in Germany, to manufacture similar equipment, including radio apparatus. An existing works will be acquired and developed to cost more than \$100,000. Charles Eisler, president, has sailed for Europe to complete arrangements.

German General Electric Co., A. E. G., Berlin, has purchased controlling interest

in National Electric Light Co., Panama, Panama, and will operate as a subsidiary. Plans are under way for expansion in power and transmission facilities.

Command-Aire, Inc., Little Rock, Ark., manufacturer of aircraft for military and commercial service, is completing plans for establishment of branch assembling plant at Santiago, Chile, one-story, to cost over \$80,000 with equipment. It is proposed to have unit ready for service in January. Robert B. Snowden is president.

Mexican Mineral Co., Mazatlan, State of Sinaloa, Mexico, has work under way on a new smelting plant on local site for production of silver, zinc and other metals, to cost more than \$175,000 with machinery.

Continental Can Co., 1 Pershing Square, New York, has purchased plant and business of Sociedad Industrial de Cuba, S. A., Havana, Cuba, and will operate as a subsidiary, including division for manufacture of bottle caps.

Thompson Products, Inc., 2196 Clarkwood Road, Cleveland, manufacturer of valves, pistons, brake rod assemblies and kindred automotive products, has purchased a controlling interest in S. A. des Etablissements Mecaniques Monopole, Ltd., Paris, France, manufacturer of similar products, with plant at Poissy, a suburb of Paris, totaling 100,000 sq. ft. floor space. Purchasing company will continue operation as a foreign subsidiary, and plans expansion. Considerable equipment will be produced under Thompson specifications, including pistons and piston rings. Charles E. Thompson is head of acquiring company.

New Trade Publications

Condensate.—W. B. Connor Co., 369 Lexington Avenue, New York. Booklet of 40 pages devoted to the draining of condensate from steam lines and steam-using apparatus. The booklet is in the nature of a treatise, illustrated, and giving particulars of equipment for doing the work outlined above.

Rotary Gas Exhausters.—Connorsville Blower Co., Connorsville, Ind. Bulletin 201 of 12 pages illustrates and describes exhausting units for service in by-product coke plants, gas plants, oil refineries, chemical manufacturing and other industries. These exhausters displace from 16,000 to more than 1,000,000 cu. ft. an hour of air or other gases.

Foundry Ovens.—Gehrnrich Oven Co., Long Island City, N. Y. Bulletin of 16 pages, profusely illustrated, devoted to ovens for core baking, mold drying, pasting, blacking, pre-heating, aging, normalizing, etc. Many of the illustrations show applications in service.

Machine Forging.—Kilborn & Bishop, New Haven, Conn. Pamphlet of 20 pages by Holloway Kilborn, reprinted from a series of articles in THE IRON AGE in April and May, 1929. This describes equipment used for forging by machinery, the design of dies and other parts, and tells how the operations are best performed.

Hot-Blast Temperature Control.—Bristol Co., Waterbury, Conn. 24-page brochure describing equipment for maintaining blast furnace bustle pipe temperature at even heat. Air from stoves is normally superheated, and the temperature lowered by bypassing a

regulated volume of wind from blowing engines direct to blast main.

Havemeyer Trusses.—Concrete Steel Co., 42 Broadway, New York. A 32-page pamphlet illustrating and describing in detail a form of truss for concrete floors and roofs which is said to give considerable construction economy. The truss is a built-up member based upon the design theory employed in bridges. Its weight for a given load capacity is said to be less than that of other types of floor members.

Recording Psychrometers.—Bristol Co., Waterbury, Conn. Catalog 2100 of 16 pages, accompanied by a four-page list price, illustrates and describes recording psychrometers of various types and shows the forms of chart produced by the instruments. A relative humidity table connecting up the wet bulb and dry bulb readings is given.

Alloy Cast Iron.—International Nickel Co., New York. A 12-page illustrated leaflet entitled "Nickel Cast Iron, Theory and Practice" contains ten studies on the results of the use of nickel in cast iron. To each study is devoted one page which, in parallel columns, gives the theory and the practice as well as illustrations of the product of certain compositions containing various amounts of nickel.

Steel Castings.—Sivyer Steel Castings Co., Milwaukee. A four-page leaflet in a series of "Sivyer Reports" is entitled "When Steel Replaces Gold." It is an argument for the use of electric steel castings with reference to the effect of cost, sales and business control upon

the gold in the profit coffers at the end of a year.

Alloy Steel.—International Nickel Co., New York. Under date of July 1, 1929, this company has issued a 12-page bulletin entitled "Buyers Guide" for nickel alloy steel products. It gives in detail the companies which produce all kinds of steel materials which contain nickel.

Steel Castings.—Lebanon Steel Foundry, Lebanon, Pa. A 4-page bulletin, illustrated, is devoted to the subject "Lebanon Steel Castings Speed Production." It discusses in general the claim that Lebanon steel castings are carrying heavy overloads successfully for various applications in trucks, tractors and special equipment for transmitting materials.

Steel Castings.—Nugent Steel Castings Co., Chicago. Bulletin No. 129 of two pages has been issued as an index of the bulletins issued by this company, an index revealing the various subjects discussed in the over 100 bulletins issued by the company.

Fuel Burning and Steam Generating Equipment.—Combustion Engineering Co., 290 Madison Avenue, New York. Catalog GC-5 of 16 pages, illustrated, describes briefly the more important fuel burning and steam generating equipment made by this company. Many sectional views are shown. Some of the illustrations show installations in use.

Wire Cloth.—Newark Wire Cloth Co., 365 Verona Avenue, Newark, N. J. Bulletin of four pages illustrating a variety of meshes of wire cloth, varying from an opening 1 in. square to 400 to the inch (150,000 to the square inch). Sieves and foundry riddles are featured.

Electronic Tornado.—Lincoln Electric Co., Cleveland. Folder describing automatic welder mounted on small carriage designed to travel along seam on pipe or flat tank bottom.

Hard Welding Rod.—Fusion Welding Corporation, Chicago. Bulletin No. 3 describes the application of "Weldite Type-T" welding rod, an intrinsically hard alloy which when deposited on a cutting tool or surface to resist abrasion has a Brinell hardness of 600 to 625 and considerable toughness.

Perlit High-Test Cast Iron.—Dursar Corporation, Newark, N. J. Folder reproducing microphotographs of Perlit iron, gun iron, and gray iron, listing physical characteristics, uses, and manufacturers of the first mentioned.

Crucible Steel Co. of America has published a booklet entitled "Quality Aircraft Steels," listing the products it makes for use in airplanes and engines, these including special steels for camshafts, connecting rods, crankshafts, cylinders, fuselage strut fittings, frame reinforcements, landing gear parts, magneto parts, push rods, valve guides, gears, etc. A list of airplane and airplane engine builders now using Crucible steels is also given.

The Division of Simplified Practice, Department of Commerce, has sent to manufacturers, distributors and users of die-head chasers requests for acceptance of the revised program of simplification adopted at the meeting of the National Machine Tool Builders, held at Asheville, N. C., in the week of May 20

The Week's News Quickly Told

Current Events That Bear on the Course of Business

TRADE continues seasonably good, although a note of conservatism characterizes many reports. Atlantic Seaboard States are generally hopeful; the heavy manufacturing regions in the Central West are a little slack; the advanced prices for stock and grain nearly compensate for the slender crops in the Northwest. Pacific Coast industries are going at a good pace with the exception of lumber. (Some 200,000 acres of National forest have been burned in recent forest fires.)

STOCK market is nervous and unstable. Brokers' loans increased to record height—\$6,760,000,000. Money rates for commercial purposes are generally high. Bank of England, in order to check gold export, raises discount rate from 5½ to 6½ per cent. Many British business men are blaming such high rates for the tardy trade revival.

INTERNATIONAL trade will doubtless follow the resumption of diplomatic relations between Russia and England, announced Saturday. Bolivia faces an economic crisis due to slack consumption of tin, which forms 90 per cent of her exports. Dr. Carl Duisberg, addressing the German Federation of Industries, says that the Pacific Ocean is becoming the center of world economics due to the ascendancy of American capital and political interests and the rapid industrial advance of Japan. . . . Senor Negri, Mexican Minister of Commerce believes that when private enterprise ceases to operate, the nation should take charge of the stagnating industry to prevent damage to the national economy.

RAILROADS on the average report 10 per cent higher net income in August than in 1928, and employees are paid at the highest rates since 1920. Even so, a 6 per cent increase in freight rates is necessary, in the opinion of R. N. Collyer, chairman Trunk Line Association, because the railroads have made money since 1922 only by better operating efficiency and an increase of \$5,000,000,000 in capital—measures which have about reached their limit. Average freight carload (27.3 tons), daily freight car travel (32.1 miles) and freight train speed (13.4 miles per hour) are all made records in July. Railroads are also using motor coaches three times as much as last year, and are steadily extending the mileage of motor freight trucks. Trucks to handle all freight

to and from metropolitan destinations via "inland" freight houses from railroad terminals in suburbs is the plan approved by Port of New York Authority and Eastern roads.

AIRCRAFT does not compete with railroad for passenger traffic, says W. D. Storey, president Santa Fe railroad, because the fares are three times as high. German Reichstag voted a large credit to the Lufthansa for a trans-Eurasian line of Zeppelins. Sir Charles Burney, builder of the British dirigible R-100, has designed a much bigger ship with a bottom like a ship's hull for docking on the water and for carrying 400 passengers.

FLYING in fog will be safer when using more sensitive altimeters, new directional gyroscopes and visual radio beacons—all instruments proved by a 15-mile "blind" flight for the Guggenheim Fund for Promotion of Aeronautics. The first airplane, Amsterdam to Dutch East Indies, completes its 10-day trip on time. One plane a week is the schedule.

SHIPPING Board loans \$17,000,000 for construction of two passenger liners and five tankers. . . . Meanwhile the White Star line stops work on its 60,000-ton ship, to study the new conditions in trans-Atlantic traffic created by the Bremen's exploits. Smaller and speedier craft are probably the more profitable in that trade. Speed is not everything, however, for half the world's tonnage built since 1920 has been for less than 12 knots. In 15 years the Panama Canal collected \$224,000,000 tolls, about two-thirds the cost. Yet maintenance and interest charges are so high that it will be 85 years before the debt is extinguished.

LABOR and employers must cooperate to bring higher wages, and shorter hours and to abolish company housing. This will solve the textile troubles, said Governor Gardner of South Carolina. . . . To help eliminate the sweat shop, J. C. Penney Co. and Sears Roebuck agree with International Ladies Garment Workers' Union to sell only such clothing as is made under approved sanitary conditions. A hospital program costing \$4,600,000 is voted by the Southern Pacific Railroad. New York building contractors agree to maintain a 5-day week and 10 per cent wage increase for 115,000 workmen in 40 trades.